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# Final Supplement to the Final Environmental Impact Statement for Oil- Gas Leasing

## Santa Fe National Forest, Rio Arriba and Sandoval Counties, New Mexico



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# Final Supplement to the Final Environmental Impact Statement for Oil-Gas Leasing

## Santa Fe National Forest, Rio Arriba and Sandoval Counties, New Mexico

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**Abstract:** The Santa Fe National Forest has prepared this “Final Supplement to the Final Environmental Impact Statement for Oil-Gas Leasing.” Originally published as the “Draft Supplement to the Final Environmental Impact Statement for Oil-Gas Leasing” in August 2010, this document supplements the “Environmental Impact Statement for Oil-Gas Leasing and Roads Management” published in June 2008. The EIS was divided into two parts: the first a programmatic analysis of a proposed forest plan amendment that would establish stipulations on new oil and gas leases to protect wildlife and National Forest System (NFS) lands and surface resources in the portion of the San Juan Basin within the Santa Fe National Forest; the second a site-specific analysis of a proposed roads closure and decommissioning project on the Cuba Ranger District.

This final supplement is specific to oil and gas leasing and analyzes new information pertaining to consistency of the proposed action (Forest Plan amendment) with the “Regionwide Programmatic Land and Resource Management Plan Biological Opinion” issued by the U.S. Fish and Wildlife Service on June 10, 2005 (Consultation No. 2-22-03-F-366). It also analyzes air quality data for the period 2006 to 2011, and includes data from the new Navajo Lake monitoring station. The final supplement also includes the 2011 interagency air quality memorandum of understanding.

The oil-gas leasing Proposed Action would amend the Forest Plan oil and gas leasing availability with stipulations that provide direction pertinent to timing limitations for certain wildlife species and for surface occupancy or use specific to sensitive NFS lands and resources, their purpose, locations, and/or conditions under which they apply, and exceptions.

The final EIS notice of availability was published in the Federal Register on September 26, 2008 (73 FR 55843). The final EIS is available on the Santa Fe National Forest Web site at <http://www.fs.fed.us/r3/sfe/projects/projects/index.html>.

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# Background

The Santa Fe National Forest (Forest) is located in north-central New Mexico, approximately 40 miles north of Albuquerque. Approximately 198,794 acres of the Forest is within the easternmost part of the San Juan Basin but is outside the basin's most productive oil and gas formations. As of September 29, 2011, approximately 69,067 acres of Santa Fe National Forest System lands are under 192 oil-gas leases.

In 2003, the Bureau of Land Management (BLM) issued a final EIS and record of decision (ROD) for the BLM-Farmington Resource Area Management Plan revision. The EIS addressed management of Federal minerals within the New Mexico portion of the San Juan Basin. Although the EIS considered the potential for development within the Forest, it was not adequate to meet Forest Service National Environmental Policy Act (NEPA) requirements.

The Santa Fe National Forest Plan, 1987 as amended (Forest Plan) provides broad direction regarding leasing and the management of oil and gas development on National Forest System land. However, the Forest Plan and its analysis final EIS did not address the potential environmental effects of future oil-gas leasing and development on the Forest sufficiently enough to make new lease issuance decisions.

In September 2004, the Forest published a notice of intent in the Federal Register initiating development of an environmental impact statement (EIS) for oil-gas leasing on the Forest. A draft EIS was released in March 2006 that proposed to amend the Forest Plan with a suite of stipulations designed to protect or minimize impacts to NFS lands and resources in the study area. The final EIS and ROD for oil and gas leasing were issued in September 2008.

Additional background information for this draft supplement can be found on the Santa Fe National Forest Web site <http://www.fs.usda.gov/projects/santafe/landmanagement/projects> under Current Projects, Oil-Gas Leasing & Roads Management ROD & FEIS.

## Supplemental Pages

This "Final Supplement to the Final Environmental Impact Statement for Oil-Gas Leasing" contains replacement pages for chapter 3 of the "Final Environmental Impact Statement for Oil-Gas Leasing and Roads Management" as follows: the "Air Quality" section, pages 84 through 92; the "Mexican Spotted Owl Timing Limitation Stipulation," page 33; The "Threatened, Endangered, and Sensitive Species" section, pages 144 and 145; and the "Mexican Spotted Owl" subsection, pages 148 through 150. Tables and figures appearing in the supplement are numbered with the "OGS" prefix (oil-gas supplement) to denote they are added.



# **Air Quality Replacement Pages**

**The following pages replace the “Air Quality” section beginning on page 84 and continuing through page 94 in chapter 3 of the “Final Environmental Impact Statement for Oil-Gas Leasing and Roads Management”**

## Air Quality

### Introduction

The primary goal of air quality management is to protect air quality within and adjacent to the SFNF. The management objectives related to this goal are to:

- Ensure that the air quality within the SFNF meets State and Federal air quality standards and regulations; and
- Protect visibility at Class 1 areas and at scenic and important vistas.

Under the Federal Land Policy and Management Act of 1976 (FLPMA) and the Clean Air Act, the U.S. Forest Service cannot conduct or authorize any activity that does not conform to all applicable local, county, state, Native American tribal, and other Federal air quality laws, statutes, regulations, standards, and implementation plans. The air quality effects analysis examines monitored data and modeled impacts based on atmospheric dispersion modeling to assess potential impacts.

The SFNF includes the San Pedro Parks Wilderness Class 1 area, and is adjacent to the Bandelier National Monument Class 1 area. Class 1 areas have been designated within the Clean Air Act as deserving the highest level of air quality protection. Congress designated (42 U.S.C. 7472)(CAA 162) 158 areas as Class 1, including national parks larger than 6,000 acres and national wilderness areas larger than 5,000 acres, in existence on August 7, 1977. These “mandatory” Class 1 areas may not be re-designated to a less protective classification. As air quality protection is legally mandated for Class 1 areas, the impact analysis focuses on potential changes to the adjacent San Pedro Parks Wilderness Class 1 area.

Under all alternatives considered in this NEPA analysis, including Alternative 1, the No Action Alternative, there is a potential for an additional 20 wells to be developed. As indicated previously, under Alternative 1, the No Action Alternative, lands would still be available for leasing according to the stipulations specified in the Forest Plan (1987 as amended). Under Alternative 2, specific stipulations would be applied to protect surface resources. Alternative 3 is similar to Alternative 2 but provides for further acreage of no surface occupancy lease stipulations. As stated previously, it has been determined that the Forest Plan and its analysis (final EIS) did not address the potential environmental effects of future leasing and development on the SFNF sufficiently enough to make new lease issuance decisions. As a result, this analysis assumes that all of the alternatives have the potential for an additional 20 wells over the next 20 years. The actual effects of these wells would only occur once they have been analyzed and authorized through a site-specific NEPA decision at the time of application to drill. The SFNF includes the southeastern edge of the San Juan Basin and since 1998 only four new wells have been constructed on the SFNF. This analysis examines the maximum development case of 20 wells being developed.

The record of decision will not authorize specific, surface-disturbing activities. The record of decision will only make a decision about which lands would be available for oil and gas leasing and what conditions and stipulations would apply to any oil and gas leases offered in the future. Environmental impacts of future oil and gas exploration and development activities would undergo future, project-specific environmental analyses.

## Affected Environment

This section describes the existing air resource for the study area and applicable air quality regulations. At the present time, the project region attains all national and New Mexico ambient air quality standards. However, the Navajo Lake monitor—approximately 50 miles northwest of the project area—has recently come very close to the National Ambient Air Quality Standard (NAAQS) for ozone and may exceed the 2008 standard at some time in the future. It is also possible that future revisions to the ozone standard will lower it even further, in which case the area may fall into nonattainment.

Air quality in a given location is defined by pollutant concentrations in the atmosphere and is generally expressed in units of parts per million (ppm) or micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). One aspect of air quality significance is a pollutant's concentration in comparison to the national and/or state ambient air quality standards. These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare, and include a reasonable margin of safety to protect the more sensitive individuals in the population. State standards, established by the New Mexico Environmental Improvement Board (EIB) and enforced by the New Mexico Environment Department, Air Quality Bureau (NMED-AQB), are termed the New Mexico Ambient Air Quality Standards (NMAAQS). The NMAAQS must be at least as restrictive as the National Ambient Air Quality Standards (NAAQS). NMAAQS also include standards for total suspended particulate matter (TSP), hydrogen sulfide, and total reduced sulfur for which there are no national standards. Table OGS-1 presents the national and State ambient air quality standards.

The pollutants of primary concern considered in this air quality analysis include volatile organic compounds (VOCs), nitrogen oxides ( $\text{NO}_x$ ), nitrogen dioxide ( $\text{NO}_2$ ), ozone ( $\text{O}_3$ ), particulate matter less than 10 microns in diameter ( $\text{PM}_{10}$ ), particulate matter less than 2.5 microns in diameter ( $\text{PM}_{2.5}$ ), and hazardous air pollutants (HAPs). Although VOCs and  $\text{NO}_x$  (other than nitrogen dioxide) have no established ambient standards, they are important as precursors to ozone formation. Additionally, greenhouse gas emissions are also of concern.

## Regulatory Setting

The New Mexico Environment Department - Air Quality Bureau (NMED-AQB) enforces air pollution regulations and sets guidelines to attain and maintain the national and State ambient air quality standards within the State of New Mexico, except for tribal lands and Bernalillo County which maintain separate jurisdictions. The NMED-AQB guidelines are found in the “New Mexico State Implementation Plan” (SIP). The following is a summary of Federal and State air quality rules and regulations that may apply to emission sources associated with the alternatives.

**Table OGS-1. National and New Mexico ambient air quality standards**

Pollutant	Averaging Time	New Mexico Standards	National Standards <sup>(a)</sup>	
			Primary <sup>(b,c)</sup>	Secondary <sup>(b,d)</sup>
Ozone	8-hour	—	0.075 ppm	Same as primary
Carbon monoxide	8-hour	8.7 ppm	9 ppm	—
	1-hour	13.1 ppm	35 ppm	—

Pollutant	Averaging Time	New Mexico Standards	National Standards <sup>(a)</sup>	
			Primary <sup>(b,c)</sup>	Secondary <sup>(b,d)</sup>
Nitrogen dioxide	Annual	0.05 ppm	0.053 ppm	Same as primary
	24-hour	0.10 ppm	—	—
	1-hour	—	0.1 ppm	—
Sulfur dioxide	Annual	0.02 ppm	0.03 ppm	—
	24-hour	0.10 ppm	0.14 ppm	—
	3-hour	—	—	0.5 ppm
	1-hour	—	0.75 ppm	—
Hydrogen sulfide	1-hour	0.010 ppm	—	—
Total Reduced Sulfur	½-hour	0.003 ppm	—	—
PM <sub>10</sub>	24-hour	Same as Federal	150 µg/m <sup>3</sup>	Same as primary
PM <sub>2.5</sub>	Annual (arithmetic mean)	Same as Federal	15 µg/m <sup>3</sup>	Same as primary
	24-hour	Same as Federal	35 µg/m <sup>3</sup>	Same as primary
Total Suspended Particulates (TSP)	Annual (geometric mean)	60 µg/m <sup>3</sup>	—	—
	30-day Average	90 µg/m <sup>3</sup>	—	—
	7-day	110 µg/m <sup>3</sup>	—	—
	24-hour	150 µg/m <sup>3</sup>	—	—
Lead	Quarterly Average	—	1.5 µg/m <sup>3</sup>	Same as primary

Notes: (a) Standards other than the 1-hour ozone, 24-hour PM<sub>10</sub>, and those based on annual averages are not to be exceeded more than once a year.

(b) To attain the 8-hour ozone standard, the 3-year average of the fourth highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm.

(c) Concentrations are expressed in units in which they were promulgated: µg/m<sup>3</sup> = micrograms per cubic meter and ppm = parts per million. Units shown as µg/m<sup>3</sup> are based upon a reference temperature of 25 °C and a reference pressure of 760 mm of mercury.

(d) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

(e) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

µg/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million

## Federal Regulations

The Federal Clean Air Act (CAA) of 1970 and its subsequent amendments established air quality regulations and authorized the Environmental Protection Agency (EPA) to develop NAAQS for several criteria pollutants known to be a threat to human health and welfare. Enforcement of these standards has been delegated to the states.

The EPA announced revised standards for ozone on March 12, 2008, of 0.075 ppm for the annual fourth highest daily maximum 8-hour concentration average over 3 years. With these new standards, some areas in northwestern New Mexico that had been in attainment under the old standards are very close to nonattainment under the new standards (NMED, 2009).

In 2004, EPA adopted a comprehensive national program to reduce emissions from future nonroad diesel engines by integrating engine and fuel controls together. These standards will substantially control sulfur, NO<sub>x</sub> and PM emissions. Fuel standards became effective in 2010 and the final Tier IV engine standards became effective in 2008 and will be fully phased in by 2014 for new engines that meet certain requirements.

EPA is under a court ordered deadline to complete a suite of regulations reducing emissions from the oil and gas industry by April 3, 2012. In July 2011, the EPA proposed a suite of standards to reduce emissions of smog-forming volatile organic compounds (VOCs) and air toxics from the oil and natural gas industry. The proposed rules also would significantly reduce methane, a potent greenhouse gas.

Any sources that have the potential to emit more than 250 tons of any criteria pollutant per year (or certain listed sources that have the potential to emit more than 100 tons per year) are required to submit a preconstruction Prevention of Significant Deterioration (PSD) Permit Application, including a regulatory PSD Increment Consumption Analysis under the Federal New Source Review permitting regulations. However, individual oil and gas well developments typically fall below these levels and are not subject to PSD analysis or regulation. PSD Class I increment thresholds are shown in table OGS-2.

**Table OGS-2. Applicable prevention of significant deterioration increment values**

Pollutant	Averaging Time	PSD Class I Increments ( $\mu\text{g}/\text{m}^3$ )	PSD Class II Increments ( $\mu\text{g}/\text{m}^3$ )
Nitrogen Dioxide	Annual	2.5	25
PM10	24-hour	8	30
	Annual	4	17
Sulfur Dioxide	3-hour	25	512
	24-hour	5	91
	Annual	2	20

Mandatory Federal Class I areas were designated by the U.S. Congress in the Clean Air Act Amendments of 1977. Wilderness areas greater than 5,000 acres and national parks greater than 6,000 acres which were in existence at that time are considered Class I under the Clean Air Act and receive the highest level of protection. All other Federal land in the country is designated as Class II areas with less stringent requirements, though Federal land managers are also responsible for protecting air quality related values (AQRVs) in these areas as well (tables OGS-3a through 3e). Sources subject to the PSD permit review procedures are required to demonstrate that impacts to AQRV in Class I areas will be below Federal Land Managers' Air Quality Related Values Workgroup (FLAG) "Limits of Acceptable Change" (FLAG 2000).

San Pedro Parks Wilderness, adjacent to the project area, was established in 1964 and is a mandatory Class I area. Under the Clean Air Act, Federal land managers (in this case the forest supervisor of the Santa Fe National Forest and the Southwestern Regional Forester) are charged with "... an affirmative responsibility to protect the air quality related values (including visibility) of any such lands within a Class I area..."

### **New Mexico Rules and Regulations**

The NMED-AQB enforces national and State ambient air quality standards by developing rules to regulate and permit stationary sources of air pollutant emissions. The New Mexico air quality regulations are found in the New Mexico Administrative Code (NMAC) Title 20, Chapter 2. Any new emission source proposed for the Santa Fe National Forest would have to comply with the NMED-AQB regulations and ambient air quality standards. The following summarizes the more pertinent State air quality regulations that could apply to project emission sources.

*20.2.33 NMAC—Gas Burning Equipment—NO<sub>2</sub>.* New/existing natural gas burning equipment that has a heat input of greater than 1 million British Thermal Units (BTUs) per hour shall not produce NO<sub>2</sub> emissions that exceed 0.2/0.3 pounds per million BTUs of heat input.

*20.2.35 NMAC—Natural Gas Processing Plant - Sulfur.* Part 35 regulates sulfur emissions from existing/new gas processing facilities.

*20.2.60 NMAC—Open Burning.* Part 60 outlines the requirements for burning small amounts of clean vegetative material. Part 60 allows the open burning of natural gas at gas plants and compressor stations and when used or produced in drilling, completion, and workover operations on oil and gas wells, when necessary to avoid serious hazard to safety.

*20.2.70 NMAC—Operating Permits.* Part 70 provides permitting requirements for stationary sources that exceed 100 tons per year (TPY) of a regulated pollutant, 10 TPY of a hazardous air pollutant (HAP), or 25 TPY of combined HAPs. Requirements include emission calculations, dispersion modeling analyses to ensure that the proposed source does not exceed any ambient air quality standard, and annual reporting.

*20.2.72 NMAC—Construction Permits.* Part 72 applies to new or modified stationary sources that (1) have a potential emission rate greater than 10 pounds per hour or 25 TPY of any air pollutant for which there is a national or State ambient air quality standard or (2) exceed hourly HAPs emission levels outlined in Section 20.2.72.502 NMAC. Requirements of Part 72 may include: (1) emission calculations; (2) dispersion modeling analyses to demonstrate that the proposed source would not contribute to an exceedance of an ambient air quality standard or Prevention of Significant Deterioration increment; (3) a determination that the proposed source would not significantly impact air quality within pristine Federal Class I areas (such as national parks greater than 6,000 acres or wilderness areas greater than 5,000 acres); and (4) public notifications.

*20.2.73 NMAC—Notice of Intent and Emissions Inventory Requirements.* Part 73 requires new or modified stationary sources that have potential emission rates

greater than 10 TPY of any regulated air contaminant or one TPY of lead, but less than the emission rates that would require a permit under 20.2.72 NMAC, to file a Notice of Intent prior to construction. Annual emission inventories are required of sources subject to 20.2.70 NMAC; the NMED-AQB may also require smaller sources to submit emission inventories.

*20.2.74 NMAC—Permits—Prevention of Significant Deterioration (PSD).* The PSD requirements apply to: (1) 28 identified stationary source types that emit or have the potential to emit more than 100 TPY of any pollutant for which there is a national ambient air quality standard; (2) any other stationary source that emits or has the potential to emit 250 TPY or more of any pollutant for which there is a national ambient air quality standard; or (3) a stationary source that emits or has the potential to emit 100,000 tons per year of CO<sub>2</sub> equivalent as of July 1, 2011. Requirements include air monitoring, emission calculations, dispersion modeling analyses, implementation of best available control technologies (BACT), and a determination that the proposed source will not significantly impact air quality within pristine Federal Class I areas. Within the project region of influence, these areas could include the Mesa Verde National Park and Weminuche Wilderness in Colorado, and the San Pedro Parks Wilderness and Bandelier National Monument in New Mexico.

In 2009, the New Mexico legislature enacted legislation which allows the Environmental Improvement Board to develop regulations to control emissions in areas which are within 95 percent of the national ozone standard. Monitors in San Juan County are under this level.

## **Region of Influence**

Identifying the region of influence for air quality effects requires knowledge of the types of pollutants being emitted, pollutant emission rates, topography, and meteorological conditions. The region of influence for inert pollutants (pollutants other than ozone and its precursors) is generally limited to a few miles downwind from a source, though there are cases when PM<sub>10</sub> and PM<sub>2.5</sub> are transported much further.

The region of influence for ozone can extend much farther downwind than for inert pollutants. Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of primary pollutants or precursors (i.e., VOCs and NO<sub>x</sub>). In the presence of solar radiation, the maximum effect of VOCs and NO<sub>x</sub> emissions on ozone levels usually occurs several hours after they are emitted and many miles from the source. Therefore, the region of influence for ozone may include much of the north-central portion of New Mexico and southern portion of Colorado.

## **Baseline Air Quality**

The EPA has designated all areas of the United States as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. A nonattainment designation generally means that a primary NAAQS standard has been exceeded more than once per year in a given area though the standards for some pollutants, such as ozone, are more complex and may require multiple year averages to exceed a certain level. Areas without sufficient data to determine the attainment/nonattainment status are designated as “unclassified.” At the present time, the entire study area (and all of Rio Arriba County and Sandoval County) is in attainment or unclassified for

all national and State ambient air quality standards. EPA evaluated monitoring data from 2008 through 2010 and determined that all areas of New Mexico are in attainment of the standard (EPA 2012).

In general, concentrations of ozone (O<sub>3</sub>) are highest during the summer months and coincide with the season of maximum sun angle which results in the strongest solar radiation reaching the earth's surface. While winter ozone events have occurred in areas of oil and gas development in Wyoming and Colorado, no such events have been observed in New Mexico.

Inert pollutant concentrations tend to be the greatest during periods of light winds, stable atmospheric conditions, and surface-based temperature inversions. These conditions limit atmospheric dispersion. However, in the case of PM<sub>10</sub> concentrations from fugitive dust episodes, maximum impacts within the study area often occur during high wind events and/or in proximity to manmade ground-disturbing activities, such as agricultural tilling, vehicular activities on unpaved surfaces, and mining operations.

Presently, there is one monitoring station within the study area. The Interagency Monitoring for Protection of Visual Environments (IMPROVE) aerosol station on Eureka Mesa is maintained by the Santa Fe National Forest to monitor pollutants contributing to visibility reduction in San Pedro Parks Wilderness. Trends in visibility are presented below. Although there are no other air quality monitoring stations in Rio Arriba County or the study area, the overall air quality of the region can be conservatively represented by data measured at the Bloomfield, Navajo Lake, and Farmington stations in nearby San Juan County to the west, as well as by data from monitoring stations located in southeast Sandoval County (tables OGS-3a, 3b, 3c, 3d, and 3e).

The Bloomfield station is located within the highly industrialized Bloomfield gas corridor and the NMED-AQB uses this station to monitor ambient pollutant levels from oil and gas sources and power plants in the Four Corners area (NMAQB 2001a). Monitors in southeast Sandoval County may be influenced by automobile traffic in this rapidly developing area. Tables OGS-3a through 3e present the maximum pollutant levels monitored at the stations located in San Juan and Sandoval Counties from 2006 through 2011, however, the data from 2011 has not yet been through quality assurance (EPA, 2009). Note that the 8-hour ozone standard applies to the 3-year average of the fourth highest value, not the individual annual maximum values.

**Table OGS-3a. Maximum pollutant concentrations (Ozone and PM<sub>10</sub>) monitored near the study area, 2006-2011**

Year	Ozone 8 Hour (ppm) (4th highest) Standard = 0.075 ppm						PM <sub>10</sub> 24 Hour (ug/m <sup>3</sup> ) Standard = 150 ug/m <sup>3</sup>					
	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Near Bernalillo	Jemez Pueblo	Bloomfield	San Juan Substation	Navajo Lake	Bernalillo	Jemez Pueblo	Crownpoint, NM, Navajo Nation
2006 <sup>1</sup>	0.063	0.071	0.079	0.074	0.064	0.072	ND	41	ND	33	233	ND
2007	0.069	0.073	0.079	0.071	0.063	0.067	ND	31	ND	30	251	ND
2008 <sup>2</sup>	0.063	0.069	0.069	0.065	0.057	0.065	ND	116	ND	31	145	105
2009	0.052	0.059	0.061	0.063	0.062	0.061	ND	73	ND	45	82	138
2010	0.065	0.063	0.069	ND	0.062	0.063	ND	22	ND	22	84	33
2011 <sup>3</sup>	0.066	0.068	0.074	ND	0.061	0.064	ND	38	ND	62	ND	37

Notes: San Juan Substation is located in Waterflow, NM, west of Farmington, NM.

Navajo Lake data is not reported to EPA, since the monitor is not a Federal Reference Monitor (FRM) nor a Federal Equivalent Monitor (FEM).

<sup>1</sup> PM<sub>10</sub> regulation effective (This standard is not to be exceeded more than once per year on average over 3 years)

<sup>2</sup> Ozone regulation effective (This standard is calculated as the 3-year average, of the fourth-highest daily maximum 8-hr concentration)

<sup>3</sup> Data for year 2011 are incomplete but represent the latest available through Dec. 2, 2011, though they have not yet been QA/QC'd.

Key: ND = No Data; ug/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million

**Table OGS-3b. Maximum pollutant concentrations (PM<sub>2.5</sub>) monitored near the study area, 2006-2011**

Year	24 Hour (ug/m <sup>3</sup> ) Standard (98 <sup>th</sup> percentile) = 35 ug/m <sup>3</sup>						Annual Mean (ug/m <sup>3</sup> ) Standard = 15 ug/m <sup>3</sup>					
	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Jemez Pueblo	Zia Pueblo	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Zia Pueblo	Jemez Pueblo
2006 <sup>1</sup>	ND	13.0	ND	13.6	42.7	18.1	ND	6.06	ND	5.23	7.72	10.39
2007	ND	17.4	ND	22	19.2	14.2	ND	5.96	ND	5.03	7.59	7.70
2008	ND	14.4	ND	10.1	72.4	ND	ND	5.91	ND	4.32	ND	ND
2009	ND	10.4	ND	10.0	32.4	ND	ND	4.42	ND	3.75	ND	ND
2010	ND	18.0	ND	ND	19.2	ND	ND	5.02	ND	ND	ND	ND
2011 <sup>2</sup>	ND	12.5	ND	ND	ND	ND	ND	4.30	ND	ND	ND	ND

Notes: San Juan Substation is located in Waterflow, NM, west of Farmington, NM.

Navajo Lake data is not reported to EPA, since the monitor is not a Federal Reference Monitor (FRM) nor a Federal Equivalent Monitor (FEM).

<sup>1</sup> PM<sub>2.5</sub> regulation effective (The 24-hour standard is calculated as the annual mean, averaged over 3 years. The annual standard is this calculated as the 98<sup>th</sup> percentile, averaged over 3 years)

<sup>2</sup> Data for year 2011 are incomplete but represent the latest available through Dec. 2, 2011, though they have not yet been QA/QC'd.

Key: ND = No Data; ug/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million

**Table OGS-3c. Maximum pollutant concentrations (NO<sub>2</sub>) monitored near the study area, 2006-2011**

Year	24 Hour (ppm) Standard = 0.10 ppm				Annual Mean (ppm) Standard = 0.50 ppm				1 Hour (ppm) Standard = 0.10 ppm (3 yr average of 98 <sup>th</sup> percentile)		
	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Bloomfield	San Juan Substation	Navajo Lake
2006 <sup>1</sup>	0.029	0.049	0.033	0.027	0.013	0.012	0.01	0.01	ND	ND	ND
2007	0.035	0.037	0.030	0.026	0.015	0.010	0.01	0.008	ND	ND	ND
2008	0.033	0.027	0.024	0.026	0.015	0.006	0.009	0.007	0.046	0.035	0.039
2009	0.030	0.030	0.030	ND	0.021	0.006	0.008	0.022	0.034	0.035	0.040
2010 <sup>2</sup>	0.028	0.038	0.030	ND	0.012	0.009	0.009	ND	0.041 (0.040)	0.041 (0.037)	0.037 (0.039)
2011 <sup>3</sup>	0.035	0.023	0.032	ND	0.012	0.011	0.008	ND	0.045	0.035	0.040

(Data from NMED, 2011)

Notes: San Juan Substation is located in Waterflow, NM, west of Farmington, NM.

<sup>1</sup> 24-hour nitrogen dioxide concentrations were conservatively estimated as one half the maximum 1-hour concentration and became effective in 2006.<sup>2</sup> NO<sub>2</sub> 1 hour regulation effective. It is calculated based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations.<sup>3</sup> Data for year 2011 are incomplete but represent data through June 30, 2011, though they have not yet been QA/QC'dKey: ND = No Data; ug/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million**Table OGS-3d. Maximum pollutant concentrations (SO<sub>2</sub>) monitored near the study area, 2006-2011**

Year	New Mexico 24 Hour (ppm) Standard = 0.10 ppm					New Mexico Annual Mean (ppm) Standard = 0.02 ppm				
	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Near Bernalillo	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Near Bernalillo
2006	0.003	0.013	ND	ND	ND	0.001	0.002	ND	ND	ND
2007	0.002	0.013	ND	ND	ND	0.001	0.002	ND	ND	ND
2008	0.002	0.004	ND	ND	ND	0.001	0.001	ND	ND	ND
2009	0.003	0.005	ND	ND	ND	0.002	0.003	ND	ND	ND
2010 <sup>1</sup>	0.002	0.002	ND	ND	ND	0.001	0.002	ND	ND	ND
2011 <sup>2</sup>	0.003	0.003	ND	ND	ND	0.002	0.003	ND	ND	ND

Notes: San Juan Substation is located in Waterflow, NM, west of Farmington, NM.

<sup>1</sup> SO<sub>2</sub> NAAQS regulations effective. It is calculated based on the 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.<sup>2</sup> Data for year 2011 are incomplete but represent the latest available through Dec. 2, 2011, though they have not yet been QA/QC'd.Key: ND = No Data; ug/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million

**Table OGS-3e. Maximum pollutant concentrations (SO<sub>2</sub>) monitored near the study area, 2009-2011**

Year	National 3 Hour (ppm) Standard = 0.5 ppm					National 1 Hour (ppm) Standard = 0.075 ppm				
	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Near Bernalillo	Bloomfield	San Juan Substation	Navajo Lake	Rio Rancho	Near Bernalillo
2009	0.005	0.020	ND	ND	ND	0.005	0.025	ND	ND	ND
2010 <sup>1</sup>	0.004	0.010	ND	ND	ND	0.006	0.014	ND	ND	ND
2011 <sup>2</sup>	0.004	0.010	ND	ND	ND	0.009	0.017	ND	ND	ND

Notes: San Juan Substation is located in Waterflow, NM, west of Farmington, NM.

<sup>1</sup> SO<sub>2</sub> NAAQS regulations effective. It is calculated based on the 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

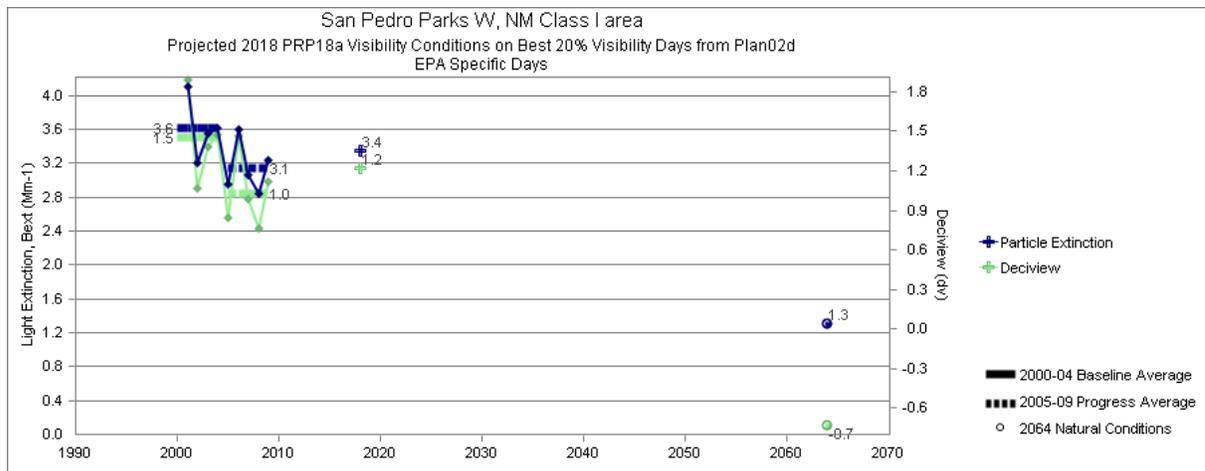
<sup>2</sup> Data for year 2011 are incomplete but represent the latest available through Dec. 2, 2011, though they have not yet been QA/QC'd.

Key: ND = No Data; ug/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million

## Visibility Trends

The San Pedro Parks Wilderness, a mandatory Class 1 area for air quality, is directly adjacent to the project area. An IMPROVE monitoring site was established on Eureka Mesa near the southern boundary of the wilderness and within the project area in August of 2000.

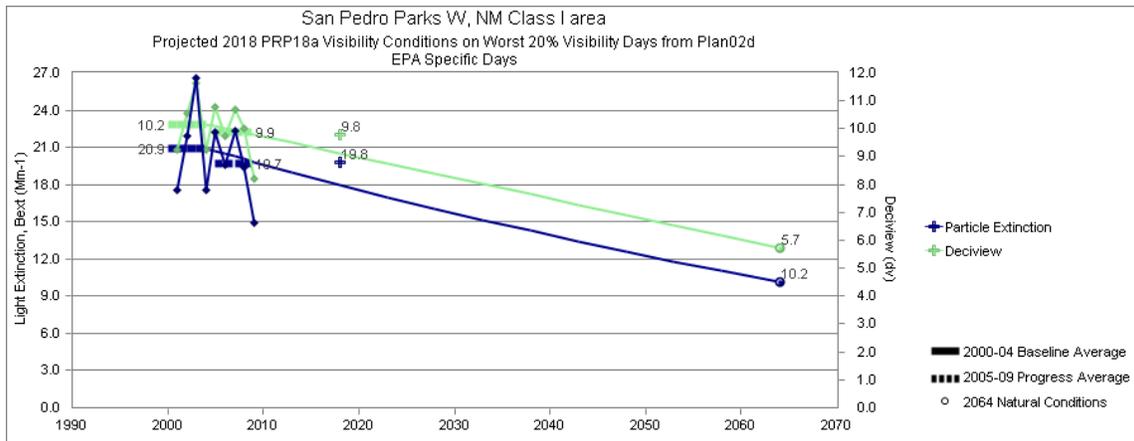
Figure OGS-1 shows visibility trends on the best 20 percent of days in San Pedro Parks Wilderness from 2001 to 2009 (note that a downward trend indicates improving visibility). Also shown are baselines established for 2000 to 2004, a baseline for 2005 to 2009, as well as monitored data from 2001 through 2009. Also included are projections for 2018, based on a 2005 emissions inventory of the South San Juan Basin, assuming projected development and the regulatory requirements in 2005. The most recent data from 2009 and the current trend based on the monitored data is less than the 2018 projection. Lastly, the visibility improvements required to meet national visibility goals by 2064 are included. In this case, when measured in deciviews (dv)—an index in which one unit is equivalent to the change in visibility noticeable by the human eye—visibility on the best days already exceeds the 2064 goal. When measured in light extinction, the current readings are ahead of the glide path (the rate at which improvements must occur in order to meet the 2064 goal) but some further improvement is needed.



(VIEWS, 2011)

**Figure OGS-1. Visibility trends on the 20 percent best days at San Pedro Parks Wilderness**

Figure OGS-2 shows the visibility trends at San Pedro Parks Wilderness on the 20 percent worst days. The baselines and projections are based on the same assumptions as in figure OGS-1, except they are based on the 20 percent worst days at San Pedro Parks Wilderness. Additionally, the glide path necessary to meet the 2064 visibility goals is included. The monitored data and current trend based on this data are below the current glide path and the 2018 projections. However, some improvements will be required in order to meet the 2064 visibility goal at San Pedro Parks Wilderness, whether measured in deciviews or light extinction.



(VIEWS, 2011)

**Figure OGS-2. Visibility trends on the 20 percent worst days at San Pedro Parks Wilderness**

Visibility impacts are generally assessed in terms of “natural background” or the expected visibility in the absence of human emission sources. The Federal land managers responsible for Class I areas have developed natural background visibility estimates for Class I areas (FLAG, 2000). This document suggests natural background visibility ranges, for light extinction, should be between 15.6 to 18 Mm-1 for Class I areas in the western United States. At San Pedro Parks Wilderness, monitored data in 2009 (14.91 Mm-1) for the 20 percent worst visibility days was degraded when compared to the natural background visibility (10.16 Mm-1).

The Reasonably Foreseeable Development Scenario (RFDS) (USFS 2004a) does not identify any areas adjacent to San Pedro Parks Wilderness as likely for new well development. The closest area where new wells are expected is approximately 10 miles northwest of the wilderness boundary.

Visibility trends in San Pedro Parks Wilderness are not solely dependent on oil and gas development but are also impacted by point sources such as the San Juan Generating Station and Four Corners Power Plant which will be required to reduce emissions contributing to visibility reduction under the Regional Haze rule. Population increases which result in higher emissions from vehicular traffic can also impact air quality related values. Although extensive oil and gas development has occurred in the San Juan Basin in recent years, and natural background visibility is currently degraded, the trends in visibility have been improving and do not indicate any significant deterioration in visibility has occurred over the last decade.

## Regional Air Emissions

The NMED-AQB compiles countywide emission inventories for stationary sources that are subject to 20.2.70 NMAC. Additionally, the EPA estimates point, area, and mobile source emissions, which are part of their National Emission Trends database. Table OGS-4 summarizes the mobile and stationary source emissions that occurred in Rio Arriba County during 2008 (EPA 2011a).

**Table OGS-4. Summary of 2008 annual emissions by source category for Rio Arriba County (in tons per year)**

Source Category	VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Fuel Combustion—Electric Utilities	1.3	18.6	36	—	0.18
Fuel Combustion—Industrial	656	2,182	1,656	—	15.9
Fuel Combustion—Other	70.4	400	55.8	1.5	55.2
Petroleum and Related Industries	133	1.07	4.05	9.31	0.2
Solvent Utilization	313	—	—	—	—
Storage and Transport	984	—	—	—	—
Other Industrial Processes	1.47	3.87	—	—	10.4
Waste Disposal and Recycling	32.7	348	17.6	2.2	95.7
Highway Vehicles	892	10,802	1,131	10.3	33.5
Off-Highway Vehicles	605	2,419	209	3.2	21.9
Miscellaneous	—	—	—	—	46,824
Total Source Emissions	3,689	16,174	3,111	26.6	47,057

Source: EPA 2011a

**Table OGS-5. Summary of 2008 annual emissions by source category for Sandoval County (tons per year)**

Source Category	VOC	CO	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>
Fuel Combustion – Industrial	18.5	196	138	2.74	32.8
Fuel Combustion – Other	205	1,151	117	3.8	161
Petroleum and Related Industries	10.4	—	—	—	—
Solvent Utilization	814	—	—	—	—
Storage and Transport	628	—	—	—	4.0
Other Industrial Processes	5.5	28.7	20.4	0.12	36.4
Waste Disposal and Recycling	303	4,254	136	2.6	505
Highway Vehicles	1,845	21,888	2,430	26.2	70.6
Off-Highway Vehicles	341	2,635	359	6.7	30.3
Miscellaneous	—	—	—	—	36,199
Total Source Emissions	4,170	30,153	3,200	42.2	37,039

Source: EPA 2011a

Natural gas production and transmission (“Petroleum and Related Industries,” table OGS-4 above) has the greatest number of stationary sources in the project region yet produces low emissions compared to other stationary sources. Fugitive dust from area sources produces the majority of PM<sub>10</sub> in the region. On-road vehicles (a mobile source) produce a large percentage of combustion emissions in the region and are the main source of carbon monoxide. Table OGS-5 provides similar information for Sandoval County.

In addition to the official emissions inventory data available from EPA presented in tables OGS-4 and 5, an inventory was conducted for the New Mexico Environment Department for ozone precursors in Rio Arriba and San Juan Counties for 2002 (Environ, 2006). This report indicates

that VOC and NO<sub>x</sub> emissions from sources like the petroleum industry in Rio Arriba County may be significantly underestimated. Historically, emissions from large stationary sources related to oil and gas processing are regulated through existing permitting programs, while smaller sources (compressor engines, drill rigs, heaters, dehydrators, tank vents, flares, etc.) fell below permitting thresholds. Individually, emissions from these smaller sources could be considered minor. However, increasing energy demands and continuing oil and gas field development make the cumulative effect of emissions from these smaller sources a significant issue, and were generally incompletely quantified.

In 2009, the Western Regional Air Partnership (WRAP) completed their Phase III Emissions Inventory for the South San Juan Basin, which includes San Juan, Rio Arriba, Sandoval, and McKinley Counties. This emissions inventory is much more representative of the emissions in this region from oil and gas in that it includes emissions from smaller sources. It does not, however, include PM emissions from fugitive dust related to construction and traffic on dirt roads in the area. The WRAP Phase III emissions inventory includes emissions for 2006 and projects emissions into 2012 from the oil and gas industry in the South San Juan Basin. Table OGS-6 presents the total number of wells in this basin. The total number of wells includes both conventional oil and gas wells as well as coal bed methane wells. Overall, the total number of wells is expected to increase in the entire basin by about 12 percent from 2006 to 2012.

**Table OGS-6. Number of wells in the South San Juan Basin**

Year	Well Count
	Total
2006	20,649
2012 (projected)	23,119

(Environ, 2009 b&c)

Notes: South San Juan Basin includes San Juan, Rio Arriba, Sandoval, and McKinley Counties. Total wells include both conventional oil and gas wells and coal bed methane.

Tables OGS-7 and 8 present emissions from 2006 and projected emissions for 2012 for NO<sub>x</sub>, VOCs, CO, SO<sub>x</sub> and PM for the four counties in the South San Juan Basin. While emissions based on the WRAP Phase III are far greater than what has been reported to EPA for major sources, all monitoring sites currently show the area to be in attainment of the NAAQS.

**Table OGS-7. WRAP Phase III baseline 2006 oil and gas emissions by county**

County/Basin	Emissions (tons per year)				
	NO <sub>x</sub>	VOC	CO	SO <sub>x</sub>	PM
McKinley	911	88	179	1	6
Rio Arriba	13,453	27,248	8,510	69	157
San Juan	27,517	32,685	14,611	231	405
Sandoval	194	676	170	3	5
South San Juan Basin	42,075	60,697	23,471	305	574

(Environ, 2009b)

**Table OGS-8. WRAP Phase III projected 2012 oil and gas emissions by county**

County/Basin	Emissions (tons per year)				
	NO <sub>x</sub>	VOC	CO	SO <sub>x</sub>	PM
McKinley	873	73	171	1	6
Rio Arriba	13,858	24,875	9,378	7	141
San Juan	28,134	30,174	15,705	124	372
Sandoval	185	584	167	0	3
South San Juan Basin	43,050	55,705	25,421	132	523

(Environ, 2009c)

The 2012 projections assume growth in development of oil and gas wells based on recent trajectories and applies “on the books” regulations and control measures as of 2006. The “on the books” regulations affecting oil and gas include: a predicted fleet mix of engines, from baseline uncontrolled engines to Tier IV engines based on typical fleet turnover for drilling rigs and workover rigs; nonroad diesel sulfur standards phased in in 2010 with a 15 ppm sulfur limit for nonroad diesel fuel; NSPS regulations covering new stationary, spark-ignited engines of various horsepower classes; and BLM COA after 2005, requirements for new or relocated wellhead compressor engines to meet a 2.0 g/hp-hr NO<sub>x</sub> emission standard.

While wells in the basin are expected to increase by 12 percent from 2006 to 2012, emissions for each of the pollutants listed in tables OGS-7 and 8 are not projected to increase at this rate. Emissions of NO<sub>x</sub> and CO are expected to increase the most, approximately 2 and 8 percent respectively. Emissions of VOCs, PM from engines, and SO<sub>x</sub> are expected to decrease over this same period, 8, 8, and 56 percent respectively, as a result of new regulations that were on the books at the time of the modeling but became effective after 2006.

## Environmental Consequences

As of 2008, there were 21,725 active oil and gas wells existing in the San Juan and Rio Arriba Counties (Environ, 2009). At the current time the area meets all State and Federal air quality standards, though the monitored values at Navajo Lake have come close in the last few years to exceeding the NAAQS for ozone.

In 2001, the BLM’s Farmington Field Office prepared a Reasonable Foreseeable Development (RFDS) scenario for the San Juan Basin (Engler, et al., 2001). Gore (USFS 2004a) extracted the portion of the San Juan Basin which occurred on the Santa Fe National Forest from the Engler report to create the 20-Year RFDS for the Santa Fe National Forest. As of April 2011, this analysis was still valid and projects 11 new gas wells in the Pictured Cliffs sandstone formation and 9 new oil and gas wells in the Mancos shale formation. Since 2005, two new Mancos wells have been drilled, and two more are proposed. Production is occurring from the Pictured Cliffs formation, but no new wells have been drilled or proposed. There has not been any industry interest in the Nacimiento, Fruitland Coal, or Entrada Formations.

When new wells are constructed, there are short-term impacts to air quality associated with developing roads, pipelines, wells pads, drilling wells, and any completion fracturing and flaring that could occur when developing a well. Also included are emissions from construction vehicles as well as fugitive dust associated with driving on unpaved roads. Typically, the initial

construction associated with developing an individual well produces the greatest amount of emissions, when compared to either the annual emissions for general maintenance or when wells need to be “worked over” to maintain or enhance production. While well development may produce the greatest amount of emissions at any given time, these impacts to air quality only occur for 1 to 2 months.

Once a well has been developed, emissions from day-to-day operations will result in impacts to air quality. On an annual basis, these emissions are not as great as those associated with developing wells, but they may last for years, or as long as the well is productive. Emissions from day-to-day operations can include those from production traffic and the associated fugitive dust, well head separator/tank flashing, dehydrators, compression stations, well head engines, heaters, and fugitive VOCs from pits.

Based on the location of the oil or gas in a given formation, there will be differences in how a well would be developed and also in the day-to-day operations of the well, which will affect the magnitude of impacts to air quality. For example, the Pictured Cliffs wells are gas wells that are generally completed to be free flowing, so no artificial lift is needed. Therefore, no small engines are required to pump gas to the surface and no well head compression is used. Based on the current level of industry interest and the density of development in the area, no additional compressors are expected to be needed for these projected wells. Alternatively, the Mancos wells are usually shallow (less than 4,000 feet deep) and produce a combination of oil, natural gas, and water. In most cases, a pumping unit (pump jack) is needed to lift the oil and water to the surface. Pump jacks are commonly powered by a single cylinder engine powered by natural gas produced at the site. The engines range from 12 horsepower (hp) to 27 hp, with an estimated average of 20 hp. Separator units are used at most of these wells to separate the production stream into oil, natural gas, and water. The separator units are heated by natural gas burners to facilitate this separation. At these wells, the oil and natural gas are generally transported by pipelines, but the produced water is stored in onsite tanks and hauled from the site in tanker trucks. The amount of water produced is highly variable, but hauling one tanker a month is reasonable. For wells in either the Pictured Cliffs or Mancos formation, periodic visits by company personnel are required, but the use of radio frequency reporting technology means these visits only occur two or three times a week.

Since 1998, only 4 wells have been developed on the Santa Fe National Forest and if this trend continues, it is unlikely that 20 wells would be developed in the next 20 years. However, this analysis assumes that 20 wells will be developed in this time period as projected in the RFDS (USFS 2004a).

## **Effects**

Under Alternative 1, the No Action Alternative, lands would still be available for leasing but leases would be issued with stipulations specified in the Forest Plan (1987 as amended). Under Alternative 2 specific stipulations would be applied to protect surface resources. Alternative 3 is similar to Alternative 2, but provides for further acreage of no surface occupancy lease stipulations. As projected by the RFDS prepared for the Santa Fe National Forest (SFNF) (USFS 2004a), all of the alternatives have the potential for an additional 20 wells over the next 20 years. While there are no expected differences to impacts to air quality between the three alternatives, it has been determined that the Forest Plan and its analysis (Final EIS) did not address the potential environmental effects of future leasing and development on the SFNF sufficiently enough to

make new lease issuance decisions. As a result, this analysis examines the effects to air quality of developing 20 new wells over the next 20 years. The actual effects of these wells would only occur once they have been analyzed and authorized through a site-specific NEPA decision at the time of application to drill.

This analysis compares an emissions inventory developed for 20 wells on the SFNF, to current estimates for emissions in the South San Juan Basin. Current monitored data is also considered to assess potential effects to air quality if 20 wells were developed on the SFNF. Lastly, existing modeling studies were analyzed for potential impacts. Due to the small number of wells that may be developed on the Santa Fe National Forest, it was impractical to directly model the emissions of 20 new wells due to the economic cost of this analysis. In addition, the results from such an analysis would likely be within the uncertainty of the models due to the small number of wells that could potentially be developed, relative to the amount of current production already ongoing in the basin.

For this analysis, an emissions inventory used in the upper San Juan Basin, originally developed for the supplemental draft EIS for the San Juan Plan Revision was modified to better represent the RFDS for the SFNF (Hall, 2011). Construction emissions included for this analysis are those associated with developing roads, pipelines, wells pads, drilling wells, and any completion fracturing and flaring that could occur when developing a well. Also included are emissions from construction vehicles as well as fugitive dust associated with driving on unpaved roads. Emissions from day-to-day operations were also calculated, including production traffic and the associated fugitive dust, well head separator/tank flashing, dehydrators, well head engines, and heaters. Based on the current level of industry interest and density of development in the area, no additional compressors are expected to be needed for these projected wells and, therefore, the associated emissions were not included.

While there are expected differences in the types of production necessary at wells associated with each formation, a conservative approach was taken, which assumed that artificial lifts, separators, and well head heaters were used at all wells. In addition, it was assumed all wells would be developed individually and there would not be multiple wells per pad. Most significantly, the 2010 nonroad diesel sulfur standards with a 15 ppm sulfur limit were not included in the emissions estimates, which assumed the previous standard of 500 ppm sulfur content. Additionally, the emissions inventory assumes no new regulations would occur in the next 20 years, which may limit emissions.

Table OGS-9 presents estimated emissions for criteria pollutants associated with oil and gas development and VOCs. The maximum development scenario assumed that 20 wells would be developed in a single year and represents the upper limit of emissions that could result in air quality impacts. The last column represents emissions that would occur on an annual basis from production, assuming that all 20 wells were developed. While this is still a conservative estimate, as it assumes that 20 wells will be developed, it represents the lower limit of emissions in this analysis. Well head work-overs were not included in this analysis as they would be expected to fall somewhere in between the upper and lower bounds, presented.

**Table OGS-9. Emissions estimated for 20 new wells (tons per year)**

Pollutant	Construction Emissions Maximum Development (tpy)	Production Emissions, Maximum Development per Year (tpy)
NO <sub>x</sub>	21.2	7.3
CO	30.8	16.3
SO <sub>2</sub>	7.7	0.0
PM <sub>10</sub>	30.5	2.4
PM <sub>2.5</sub>	10.4	0.9
VOC	11.2	4.9

Table OGS-10 compares the estimates of emissions for the maximum development scenario of constructing 20 wells in a year for NO<sub>x</sub>, CO, SO<sub>2</sub>, and VOCs to the total emissions estimates from oil and gas development in Rio Arriba County based on the 2006 and 2012 WRAP emissions inventories (tables OGS-7 and 8) (Environ, 2009 b & c). With the exception of estimated SO<sub>2</sub> emissions, the emissions from NO<sub>x</sub>, CO, and VOCs are less than 1 percent of the estimated emissions from the oil and gas industry in the county based on WRAP estimates. SO<sub>2</sub> emissions estimates from construction of 20 new wells are greater than WRAP's estimated emissions of SO<sub>2</sub> in Rio Arriba County by over 11 percent in 2006 and more than double WRAP's emissions estimates for 2012. However, there are two key factors to consider. First, the calculated emissions for the 20 well scenario do not consider the current nonroad diesel standards, with a 15 ppm sulfur limit, which is factored into the 2012 WRAP estimate; rather, it calculates SO<sub>2</sub> emissions assuming diesel fuel with 500 ppm sulfur content. Second, the 20 wells have not been constructed and the measured values of SO<sub>2</sub> in New Mexico in 2006 were far below the NAAQS. Even if the SO<sub>2</sub> emissions were twice the estimated 7 tons in 2012, this would be approximately 21 percent of the estimated emissions for 2006 from this industry, due to new regulations that are currently on the books.

**Table OGS-10. Construction emissions (20 wells) compared to WRAP 2006 and 2012 estimates for Rio Arriba County for NO<sub>x</sub>, CO, SO<sub>2</sub>, and VOCs (tons per year)**

Pollutant	Construction Emissions Maximum Development Including Flaring (tpy)	WRAP 2006 Rio Arriba	Construction Emissions as Percent of Total	WRAP 2012 Rio Arriba	Construction Emissions as Percent of Total
NO <sub>x</sub>	21.2	13,453	0.2%	13,858	0.2%
CO	30.8	8,510	0.5%	9,378	0.4%
SO <sub>2</sub>	7.7	69	11.1%	7	109.8%
VOC	11.2	27,248	0.2%	24,875	0.3%

(Environ, 2009 b & c)

Table OGS-11 compares the estimates of emissions for the maximum development scenario of constructing 20 wells in a year for PM<sub>10</sub> to the total emissions estimates from oil and gas development in Rio Arriba County based on what was reported to EPA in 2008 (table OG-21) (EPA 2011a). These estimates were considered rather than the WRAP estimates because the EPA values include estimates of fugitive dust associated with driving on nonpaved surfaces, while the WRAP study does not. Since fugitive dust from driving on nonpaved surfaces was calculated for the construction emissions from 20 wells on the SFNF, this is a more appropriate comparison.

Based on this comparison, estimated PM10 emissions from constructing 20 new wells in 1 year results in less than 1 percent of the total PM10 emissions reported to EPA for 2008.

**Table OGS-11. Construction emissions (20 wells) compared to EPA 2008 estimates for Rio Arriba County for PM<sub>10</sub> (tons per year)**

Construction Emissions Maximum Development Including Flaring (tpy)	EPA 2008 Emissions All Sectors	Construction Emissions as Percent of Total
30.5	47,057	0.06%

(EPA 2011a)

As stated previously, New Mexico typically has very good air quality. Over the last several years, air quality in the Four Corners region—as demonstrated in the “Baseline Air Quality” section—is usually far below NAAQS and New Mexico standards. One exception has been ozone which has recently approached levels near the NAAQS.

Ozone forms when two pollutants—NO<sub>x</sub> and VOCs—react with sunlight. While the EPA did not lower the ozone NAAQS from 0.075 ppm in 2011, they have indicated that this standard will be reviewed in 2013. The ozone NAAQS is calculated as the average of 3 consecutive years of the fourth highest 8-hour average. The monitoring station located at Navajo Lake has had the highest measured levels of ozone in northern New Mexico. From 2008 to 2010, the official 3-year averages have been 0.075, 0.069, and 0.066 ppm respectively. Unofficially, the average ending in 2011 was 0.068. It is unlikely that NO<sub>x</sub> and VOC emissions from 20 wells, which make up less than 1 percent of the emissions estimated from oil and gas in Rio Arriba County, would have a significant effect of contributing to an exceedance of the current national or New Mexico air quality standards, due to their small contribution and location in the basin.

Modeling of NO<sub>x</sub> for 694 wells on the Jicarilla Ranger District of the Carson National Forest—which is less than 20 miles from the area of the Santa Fe National Forest where the most development is expected to occur according to the RFDS—showed that concentrations at Class 1 areas in northern New Mexico and southern Colorado would be significantly less than the allowable PSD increments (USFS 2008), even with cumulative effects considered. It can, therefore, be concluded that impacts from 20 wells would be less than significant even at nearby San Pedro Parks Wilderness.

Additional modeling was completed as part of the work of the Four Corners Air Quality Task Force (Environ, 2009). This project models the air quality impacts of applying mitigation strategies for reduction of emissions from power plants and oil and gas development. The base case modeling for 2005 shows ozone levels in the vicinity of San Pedro Parks Wilderness to be between 0.065 and 0.069 ppm compared with the NAAQS for ozone of 0.075 ppm. The modeling study also shows virtually no change in the level of ozone between 2005 and 2018 base case (without mitigations) despite extensive oil and gas development in the region. The study analyzed the predicted sources of both ozone and PM in 2018 in the Four Corners area. These results showed that local oil and gas and electric generating units (EGUs) sources are the biggest contributors to ozone and PM concentration in the Four Corners area after contributions from outside the region. EGU and oil and gas together account for 75 percent of NO<sub>x</sub> emissions (oil and gas alone accounts for 37 percent NO<sub>x</sub> emissions) and 33 percent of VOC emissions in the 2018 base case inventory. The study examined the potential effectiveness of various reductions to PM and ozone forming precursors (NO<sub>x</sub> and VOCs) that could be achieved through various

mitigation strategies applied to EGUs and the oil and gas industry. The scenario which applied the most stringent NO<sub>x</sub> and VOC emissions required EGU and the oil and gas industry to reduce NO<sub>x</sub> and VOCs by 50 and 16 percent respectively. This mitigation scenario resulted in predicted ozone changes generally limited to less than about 5 ppb. However, as ozone standards are lowered, this reduction could be significant to ensuring continued attainment. In addition, oil and gas mitigations examined in this study did not have any significant visibility impacts, to Class 1 areas, generally less than 0.5 dV. However, when added to other area source impacts, this could be significant in improving visibility.

On June 23, 2011, the U.S. Department of Agriculture (USDA), U.S. Department of the Interior (DOI), and U.S. Environmental Protection Agency (EPA) signed a memorandum of understanding (MOU) (OGS Appendix A) committing to a clearly defined approach for air quality analyses in NEPA analyses for oil and gas development on Federal lands. Agencies can consider applying the MOU to ongoing NEPA analyses, where commenters have questioned the adequacy of air quality analysis, if such analysis can be accomplished in a cost effective and timely manner.

Due to the small number of wells that may be developed on the Santa Fe National Forest, it was impractical to directly model the emissions of 20 new wells due to the cost of such an analysis. In addition, the results from such an analysis would likely be within the uncertainty of the models due to the small number of wells that could potentially be developed, relative to the amount of current production already ongoing in the basin. For example, the emission inventory produced for this analysis showed less than a 1 percent increase in all pollutants except SO<sub>2</sub>, when compared to the most current data available. Yet a 50 percent reduction in NO<sub>x</sub> and a 16 percent reduction in VOCs in the 2009 ENVIRON modeling show a less than a 5 ppb reduction to predicted ozone levels. While this was the most effective scenario at reducing ozone concentrations, it applied reductions to both electric generating units (EGUs) as well as the oil and gas industry. As stated previously, both EGUs and the oil and gas industry in the region make up approximately 75 percent of the NO<sub>x</sub> emissions (33 percent of the VOC emissions), of which, the more than 20,000 wells and associated infrastructure make up about half of these emissions. Lastly, both the ozone and visibility modeling done in ENVIRON's 2009 study demonstrated virtually no change in the level of ozone between 2005 and 2018 despite extensive oil and gas development in the region and under various emissions reduction scenarios.

### **Cumulative Impacts**

The development of 20 new locations is projected by the RFDS (USFS 2004a) to be reasonably foreseeable in the study area. Impacts associated with this well development would be adverse, but less than significant, in that their development would not result in exceedences of State or Federal air quality standards, nor increases in visibility degradation at nearby Class I areas. However, emissions from these wells would be in addition to those from the 21,725 active oil and gas wells existing in San Juan and Rio Arriba Counties in 2008 (Environ 2009) and any additional new development in the area.

Modeling performed for a high density well development scenario for the "Surface Management of Gas Leasing and Development, Jicarilla Ranger District, Carson National Forest" (USFS 2008) indicated that (1) maximum modeled impact concentrations would be less than the national or New Mexico ambient air quality standards and (2) risks from exposure to hazardous air pollutants would be less than significant, in that they are not expected to result in increased risk based on

EPA's National Air Toxics Assessment (see next section). Impacts for well development in the San Juan Basin on the Santa Fe National Forest would be even less because there are no high density well areas (up to eight wells per square mile) as there are on the Carson National Forest. Furthermore, the Carson National Forest modeling analysis included a large 10,000-hp central compressor station that would not be needed for the lower density well operations in the San Juan Basin.

Air quality impacts would occur during both well construction (due to surface disturbance by earth-moving equipment, vehicle traffic fugitive dust, well testing, and drilling rig and vehicle engine exhaust) and well production (including natural gas separation and dehydration heaters, compressors, and small well head engine exhausts). The maximum predicted "near field" air pollutant concentrations associated with well development and production would occur close to the actual well location; so close that adding additional wells in other field locations would not increase the maximum predicted "near field" concentrations (BLM 2002).

Emissions from oil and gas well operation sources could disperse for long distances downwind and contribute to cumulative visibility impacts in PSD Class I areas and/or ozone impacts in areas nearing ozone nonattainment. Even though the contribution of impacts from this project is small and less than significant within the study area, the impact could become significant on a cumulative basis if it would cause or add to a new or existing problem of visibility degradation or ozone nonattainment. If the ozone NAAQS were to be lowered at any time in the next 20 years, any additional contribution of these pollutants could become a significant impact. Cumulative impacts could be reduced with application of recommended mitigation measures, but these would be far more effective if applied across the basin.

Modeling performed for the Four Corners area (Environ, 2009) shows virtually no change in ozone levels from 2005 to 2018 in the project area due to the application of emission controls on future developments. The study also indicated that much of the pollution contributing to high ozone levels is transported from outside the region.

Other foreseeable future Santa Fe National Forest projects planned in or near the study area that may affect air quality—in combination with current and projected oil or gas well construction and production—are those that would result in surface disturbance, causing temporary decreases in air quality by increasing particulates. Projects 2, 3, 4, 6, 7, and 8 listed in table OG-15 (FEIS, chapter 3, pages 75–76; [www.fs.fed.us/r3/sfe/](http://www.fs.fed.us/r3/sfe/)) are likely to result in short-term particulate matter (PM) sources that would add to those emissions projected from local and regional oil and gas development. Due to the temporary nature of air quality impacts from these Forest Service projects, the cumulative effects would not be significant over the long term.

Visibility trends in the San Pedro Parks Wilderness are not solely dependent on oil and gas development but are also impacted by point sources such as the San Juan Generating Station and Four Corners Power Plant which will be required to reduce emissions contributing to visibility reduction under the Regional Haze rule. Population increases which result in higher emissions from vehicular traffic can also impact air quality related values. Although extensive oil and gas development has occurred in the San Juan Basin in recent years, and natural background visibility is currently degraded, the trends in visibility have been improving and do not indicate any significant deterioration in visibility has occurred over the last decade.

## Hazardous Air Pollutants (HAPs)

Hazardous air pollutants are those pollutants that cause or may cause cancer or other serious health effects—such as reproductive effects or birth defects—or adverse environmental and ecological effects. NMED is required to control 187 hazardous air pollutants, some of which are emitted by the oil and gas industry. NMED collects emissions data from major point sources and provides this to the EPA. Table OGS-12 lists the total amount of HAPs emitted from the oil and gas production, industrial process sector, for each county in the South San Juan Basin. Not included in this summary are HAPs emitted from mobile sources, such as trucks transporting people, equipment, and waste to and from wells, nonroad diesel engines related to this sector, storage and transport of product from the well sites, nor venting or flaring related to this sector. HAPs reported to the EPA for this sector include: Benzene, Hexane, Toluene, Xylenes (Mixed Isomers), Ethylene Glycol, Formaldehyde, Ethyl Benzene, Styrene, 2,2,4-Trimethylpentane, Methanol, Acetaldehyde, Toluene-2, 4-Diamine, and Hydrogen Fluoride.

**Table OGS-12. Hazardous air pollutant emissions 2008 by county**

Industrial Processes - Oil and Gas Production Total		
County	Emission (lbs)	Emissions (tons)
Rio Arriba	41,640	20.8
San Juan	112,990	56.5
McKinley	11,172	5.6
Sandoval	No data	No data

(EPA, 2011a)

On March 11, 2011, the EPA released the “National Air Toxics Assessment” (EPA 2011b) that identifies the health risks from breathing HAPs in various geographic areas. The assessment included emissions from stationary and mobile sources, as well as background concentrations from long-range transports and natural emissions, and from secondary formation from pollutants formed from other pollutants. The assessment looked at both cancer risks and noncancer related risks. The risks from HAPs in the counties in the South San Juan Basin were generally low for both cancer and other health risks associated with HAPs. The highest risks were for cancer in part of San Juan County near Farmington and Bloomfield which had cancer risks as high as 34 out of 1 million individuals. Parts of Rio Arriba County north of Cuba, west of the Continental Divide had risks as high as 27 out of 1 million. The rest of the area typically had risks for cancer from HAPs at less than 20 out of 1 million. EPA considers these levels of risk from HAPs as acceptable. Based on this data, and the fact that no high density development is predicted on the Santa Fe National Forest, the risks from exposure to hazardous air pollutants would be less than significant in that emissions from the development of 20 wells are not expected to result in increased risk based on EPA’s “National Air Toxics Assessment.”

## Greenhouse Gases

The assessment of greenhouse gas emissions and climate change is in its formative phase; therefore, it is not yet possible to know with confidence the net impact to climate. However, the Intergovernmental Panel on Climate Change (IPCC 2007) has concluded that—warming of the climate system is unequivocal and—most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in

anthropogenic (manmade) greenhouse gas concentrations. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. Potential impacts to air quality due to climate change are likely to be varied and dependent on which climate scenario plays out.

Oil and gas development activities on the SFNF are predicted to produce greenhouse gas emissions. The amount of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) emissions associated with well development for the RFDS were estimated for well drilling, well completion, and gas production. While emission inventories are continually being improved, estimates of greenhouse gas emissions for oil and gas activities were calculated using assumptions from EPA AP-42 tables for different engines used for oil and gas drilling and production, following the methodology used in the “San Juan Public Lands Supplemental Draft EIS for Air Quality” (SJPL, 2011a) (Palmer, 2010).

A very conservative estimate that assumes that 20 wells would be developed in a single year estimates a total of 3,350 metric tons per year of greenhouse gases measured in carbon dioxide equivalent (CO<sub>2e</sub>) which accounts for differences in warming potential. By comparison, the greenhouse gas emissions of Rio Arriba County for 2008 were estimated to be 396,000 metric tons CO<sub>2e</sub> (NMED, 2010). While this is very likely an overestimate, it results in less than 1 percent of the total CO<sub>2e</sub> emissions in Rio Arriba County.

## **Mitigation**

The air quality impact analysis indicated that while there are adverse impacts to air quality, it is unlikely that significant environmental effects would occur. At this time, the SFNF does not require specific mitigation measures to reduce potential impacts to air quality. Under all alternatives considered in this NEPA analysis, there is a potential for an additional 20 wells to be developed. Some alternatives have specific stipulations that would be applied to protect surface resources. The actual effects of these wells to air quality would only occur once they have been analyzed and authorized through a site-specific NEPA decision at the time of application for permit to drill (APD). Based upon the analysis results, mitigation options could be considered in more detail.

The Forest Service and Bureau of Land Management (BLM) have been participants in the Four Corners Air Quality Group (formerly task force). This group has identified numerous potential mitigation strategies (FCAQTF 2007). The “EPA Gas Star Program” (EPA 2011c) and the “Emission Reduction Techniques for Oil and Gas Activities” (USFS 2011) have also identified other mitigation strategies to reduce air pollution from oil and gas development. These mitigation measures must be applied on a case-by-case basis and evaluated in the APD NEPA analysis rather than in this programmatic document. Cumulative impacts could be reduced with application of recommended mitigation measures, but these would be more effective if applied across the basin. The Forest Service is committed to working with the BLM to ensure reduction of emissions which contribute to ozone formation and could potentially impact air quality values in San Pedro Parks Wilderness and other nearby Class 1 areas.

The “Air Quality Modeling Study for the Four Corners Area” (Environ, 2009) demonstrates that ozone reductions and improvement to visibility are possible if high level controls are implemented for both oil and gas operations and power plants throughout the Four Corners Region. The controls considered in detail for the oil and gas sector were VOC control for

pneumatic devices, flaring, and venting. The controls considered for NO<sub>x</sub> were emission reductions on existing engines. The SFNF will consider these findings when developing air quality mitigation measures for potential future oil and gas development on the SFNF. Many guidelines and mitigation measures focus on the VOC and NO<sub>x</sub> controls developed by the Four Corners Air Quality Task Force as a result of the “Air Quality Modeling Study for the Four Corners Area.” This study also concluded that mitigation strategies that reduce both NO<sub>x</sub> and VOCs across the region for both power plants and oil and gas development to be most effective at reducing ozone.

Methane gas emission reduction measures could also be considered to minimize the production of greenhouse gases related to management activities on the SFNF, such as green completions.

The only current emission control standard, required by the BLM on their COA is for compressor engines 300 horsepower or less used during well production. These engines must be rated by the manufacturer as emitting NO<sub>x</sub> at 2 grams per horsepower hour or less to comply with the NMED-AQB’s guidance.

As mentioned previously, EPA is currently under a court ordered deadline to finalize four rules to reduce air pollution from the oil and gas industry by April 3, 2012. The current proposal includes a new source performance standard for VOCs; a new source performance standard for sulfur dioxide; an air toxics standard for oil and natural gas production; and an air toxics standard for natural gas transmission and storage. The proposed rules would rely on proven technologies and best practices that are currently in use and could reduce VOCs, HAPs, GHG, and criteria pollutants significantly.

The Santa Fe National Forest and New Mexico Environment Department will begin operating an ozone monitor in 2012 near San Pedro Parks Wilderness to ensure no negative impacts to visibility in this Class 1 area and no violation of ambient air quality standards for ozone occur. In addition, the WRAP is in the process of conducting high resolution modeling using the Phase III emissions inventory cited in this document. Both the monitoring data and the results of this assessment will be considered at the time of new applications to drill as part of a site-specific NEPA decision in the near term.



# **Timing Stipulation Replacement Page**

**The following page replaces the “Resource:  
Mexican Spotted Owl Timing Stipulation”  
section on page 33 in chapter 2 of the “Final  
Environmental Impact Statement for Oil-Gas  
Leasing and Roads Management”**

**Resource: Mexican Spotted Owl**

**Stipulation:** Timing limitation on drilling operations and construction activities: March 1 to August 31

**Location:** Currently there are four designated protected activity centers (PACs) ranging in size from 365 to 610 acres. Would apply wherever there is a designated PAC.

**Purpose:** To protect and limit disturbance from drilling and construction activities within Mexican spotted owl PACs (nesting/fledgling areas) to minimize risks to reproductive and post-fledgling success of Mexican spotted owls during the critical nesting/breeding period defined in the recovery plan for this federally listed threatened species as well as the Forest Plan (Appendix D, pg. 2). Would not apply to daily operations and maintenance of producing wells.

**Exception:** An exception, modification, or waiver to the timing limitation may be granted if site-specific surface use plan of operations demonstrates that adverse effects to threatened and endangered species can be avoided, effects are documented in a biological assessment, and concurrence from the U.S. Fish and Wildlife Service is obtained. A public notice and comment period is required prior to waiver, exception, or modification of this stipulation.

# **Threatened, Endangered, and Sensitive Species Replacement Pages**

**The following pages replace the “Threatened, Endangered, and Sensitive Species” section beginning on page 144 and continuing through page 145 in chapter 3 of the “Final Environmental Impact Statement for Oil-Gas Leasing and Roads Management”**

## Threatened, Endangered, and Sensitive Species Affected Environment and Environmental Consequences

Special status wildlife, fish, and plants discussed in this section include species that are listed as threatened or endangered (T&E) under the Federal Endangered Species Act (ESA), Forest Service Region 3 sensitive species, or other species of special concern.

The Forest Service has adopted policies to ensure that Agency actions do not result in the decline of species and the subsequent listing under the ESA. Those plants and animals listed as sensitive with the Forest Service have been identified by the Regional Forester for which population viability is a concern as evidenced by significant or predicted downward trends in either population or habitat capability (CNHP 1999).

Table OGS-9 lists threatened, endangered, and sensitive species occurring on the Santa Fe National Forest or in the Rio Grande, with information on status and likelihood of occurrence in the study area (NMDGF 2002; NMRPTC 2002).

Ten of the 21 species listed in table OGS-9 are known to occur or may occur in the study area. The other 15 species are highly unlikely to occur in the study area based on their known distribution or due to a lack of suitable habitat, and would not be affected by Forest Service actions within the study area.

**Table OGS-13. Threatened, endangered, and sensitive species occurring on or near the Santa Fe National Forest, with potential of occurrence in the study area**

Common Name	Scientific Name	Status <sup>1</sup>	Potential to Occur in the Study Area
Goat peak pika	<i>Ochotona princeps nigrescens</i>	FS	Does not occur in the study area based on species habitat and distribution.
New Mexican (meadow) jumping mouse	<i>Zapus hudsonius luteus</i>	FS	May occur in riparian, mesic grass areas.
Swift fox	<i>Vulpes velox</i>	FS	Does not occur in the study area based on species habitat and distribution.
Bald eagle	<i>Haliaeetus leucocephalus</i>	FS	Adjacent Chama River corridor overwintering (Nov. 1 to Mar. 1) area. Incidental in the study area only in winter.
American peregrine falcon	<i>Falco peregrinus anatum</i>	FS	One known nest site, a portion of outer (D) zone of another nest site, and 1 to 3 potential cliff nest sites within or bordering the north part of the study area.
Northern goshawk	<i>Accipiter gentilis</i>	FS	Habitat present and two PFAs (post-fledgling areas) in northeastern part of the study area.
Boreal owl	<i>Aegolius funereus</i>	FS	May occur in high elevation spruce-fir forest in the study area.
Mexican spotted owl	<i>Strix occidentalis lucida</i>	T	All or parts of four designated PACs (nest sites) and 6,736 acres critical habitat in the study area.
Southwestern willow flycatcher	<i>Empidonax traillii eximius</i>	E	Does not occur in study area based on species habitat and distribution.
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	FS	Does not occur in the study area based on species habitat and distribution.
White-tailed ptarmigan	<i>Lagopus leucurus</i>	FS	Does not occur in the study area based on species habitat and distribution.

Common Name	Scientific Name	Status <sup>1</sup>	Potential to Occur in the Study Area
Jemez Mountains salamander	<i>Plethodon neomexicanus</i>	FS	Does not occur in the study area based on species habitat and distribution.
Northern leopard frog	<i>Rana pipiens</i>	FS	May occur in riparian, mesic grass areas.
Rio Grande silvery minnow	<i>Hybognathus amarus</i>	E	Does not occur in the study area; species restricted to the middle Rio Grande, downstream from watersheds of the forest.
Rio Grande chub	<i>Gila Pandora</i>	FS	Found in segments of Clear Creek.
Rio Grande cutthroat trout	<i>Oncorhynchus clarki virginialis</i>	FS	Found in segments of Clear Creek, San Jose Creek, Cecilia Creek, La Jara Creek, Rito de los Piños, Rio Capulin, and Rio Puerco del Grande in the study area.
Blue-black silverspot butterfly	<i>Speyeria Nokomis Nokomis</i>	FS	Not recorded in Sandoval and Rio Arriba Counties.
Holy ghost ipomopsis	<i>Ipomopsis sancti-spiritus</i>	E	Does not occur in the study area based on species habitat and distribution; known only in one canyon in the southern Sangre de Cristo Mountains.
Hairless fleabane	<i>Erigeron subglaber</i>	FS	Does not occur in the study area based on species habitat and distribution.
Chiricahua (bloomer's) dock	<i>Rumex orthoneurus</i>	FS	Does not occur in the study area based on species habitat and distribution.
Arizona willow	<i>Salix arizonica</i>	FS	Does not occur in the study area based on species habitat and distribution.

<sup>1</sup> FS = Forest Service Region 3 Sensitive Species  
E = Endangered Species (USFWS)  
T = Threatened Species (USFWS)

The biological assessment for this project (SAIC, 2006) states the “Proposed action does not include any conditions of approval (COA) or mitigation measures, which are developed and applied during second level NEPA site-specific analysis of the application for permit to drill (APD).”

The biological assessment for this project determined that the action alternatives would not adversely affect listed, proposed, or candidate threatened or endangered species, and/or designated or proposed critical habitats.



# **Mexican Spotted Owl Replacement Pages**

**The following pages replace the “Mexican Spotted Owl” section beginning on page 148 and continuing through page 150 in chapter 3 of the “Final Environmental Impact Statement for Oil-Gas Leasing and Roads Management”**

## Mexican Spotted Owl (*Strix occidentalis lucida*)

### Affected Environment

The Mexican spotted owl (MSO) occurs in Rio Arriba County (NMDGF 2003), with nesting documented in the study area; however, no nesting pair has been found in the study area in recent years. There are four designated MSO protected activity centers (PACs) shown on figure OGS-3 with the designated critical habitat in the study area. A summary of current Forest Plan lease standards and guidelines overlapping MSO PACs and critical habitat are shown in table OGS-14.

**Table OGS-14. Existing Forest Plan oil-gas lease standards and guidelines within MSO PACs and critical habitat**

Area	Standard Lease Terms and Conditions (acres)	Limited Surface Use (acres)
MSO PACs	2,035	0
MSO critical habitat	6,736	0
MSO critical habitat outside PACs	5,345	0

The MSOs habitat is characterized by high structural complexity and canopy closure (Stacey and Hodgson 1999). It prefers unevenaged, multilayered old growth or mature mixed conifer forests (with large diameter trees, snags, and logs); stands of ponderosa pine-oak woodlands with a well-developed understory of Gambel oak; and steep canyons and shady canyon bottoms where a variety of deciduous and coniferous trees form multiple vegetation layers (USFWS 1995, Stacey and Hodgson 1999). Currently there four MSO PACs totaling 2,035 acres and an additional 6,736 acres of designated MSO critical habitat within the study area (figure OGS-3).

### Environmental Consequences

The MSO is vulnerable to habitat loss or alteration of mature mixed conifer forest. Critical habitat for MSO exists in the southern portion of the study area. Activities that fragment mature mixed conifer forest, such as construction and oil-gas well development and maintenance, would be potentially detrimental to the MSO. A summary of proposed lease stipulations<sup>1</sup> MSO areas are shown in table OGS-15. The oil-gas leasing decision to be made in this EIS would have no direct, on-the-ground effects on habitat or wildlife populations, but may affect future oil-gas development through stipulations on development under new leases. All reasonably foreseeable development is projected to occur on existing leases under standard terms and conditions. Site-specific NEPA analysis would involve the selection of conditions of approval developed during the APD process and would take into account the existence of threatened, endangered, and sensitive species according to required protocols.

### Alternative 1—No Action

Under the No Action Alternative, leasing would continue under standard terms and conditions, except for limited surface use in management areas D and L that emphasize visual quality/developed recreation and semiprimitive, nonmotorized recreation, respectively. ESA

<sup>1</sup> Stipulation is common oil-gas leasing terminology; once codified into the Forest Plan, the stipulations would be referred to as a standard and guideline.

consultation on the Forest Plan is current; therefore, no re-initiation of consultation would be required because the Forest Plan would not be changed or amended under this alternative. There would be no change in effects to MSO, MSO PACs, or their critical habitat from new oil-gas leases because the lease would be subject to applicable laws and regulations. Furthermore, Section 6 of the USDI Bureau of Land Management Oil and Gas Lease (Form 3100-11) requires that lessees conduct operations to minimize impacts to biological resources, which may include modification to siting or design of facilities, and timing of operations; and if a threatened or endangered species is observed during operations, lessee must cease operations that would result in the destruction of such species.

### **Alternative 2—Proposed Action**

The Proposed Action would have more stringent restrictions to protect MSO PACs and critical habitat than the No Action Alternative through the establishment of a timing limitation stipulation on new oil-gas leases. Because no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action, the new lease stipulations would not affect MSOs or their critical habitat. Within the four MSO PACs wholly or partially within the study area, the proposed “timing limitation” (TL) stipulation would apply to all 2,035 PAC acres. The proposed “no surface occupancy” (NSO) stipulation would apply to 642 PAC acres, and the proposed “controlled surface use” (CSU) stipulation would apply to PAC 17 acres; the NSO and CSU stipulations overlap the TL stipulation. Within MSO critical habitat but outside the PACs, the TL stipulation would not apply; however, the NSO stipulation would apply to 349 acres of critical habitat, and the CSU stipulation would apply to 52 acres of critical habitat. The NSO stipulation would provide protection because it would apply to slopes  $\geq 40$  percent, areas that MSO generally prefer.

The biological assessment for this project determined that the action alternatives would not adversely affect the MSO or other listed, proposed, or candidate threatened or endangered species, and/or designated or proposed critical habitats. Although the 2005 consultation on Forest Plan amendments resulted in a “may affect, likely to adversely affect” determination for the MSO, it was not based on oil-gas activities.

The MSO PAC timing limitation stipulation allows for granting of an exception, modification, or waiver of the timing limitation if surveys according to protocol are conducted and the PAC is not used for nesting. This allowance would not invalidate the “no effect” determination for the Proposed Action for the following reasons. None of the designated MSO PACs in the study area are within areas currently under lease and a request for an exception, modification or waiver of the timing limitation would accompany the oil-gas leaseholder’s application for permit to drill (APD) and, therefore, would be included in the site-specific NEPA analysis of the APD. Should a request be submitted after the NEPA process for the APD has been completed and the APD approved, the timing limitation stipulation would require a 30- to 90-day public review period (36 CFR 219.8) that includes appropriate NEPA analysis, consultation with the U.S. Fish and Wildlife Service, and Endangered Species Act and Forest Plan compliance. The NEPA and ESA compliance requirement would also apply if, at a future date, a MSO PAC was established on an existing lease as described under the No Action Alternative.

## SFNF Oil & Gas EIS

Stipulation acres inside and outside MSO PACs

### Legend

#### Mexican\_Spotted\_Owl\_pl

##### MSO\_MGT\_ID

-  031002033
-  031002034
-  031002035
-  031002042
-  MSO Critical Habitat

#### PA\_stips\_with\_MSOPAC\_and\_CritHab

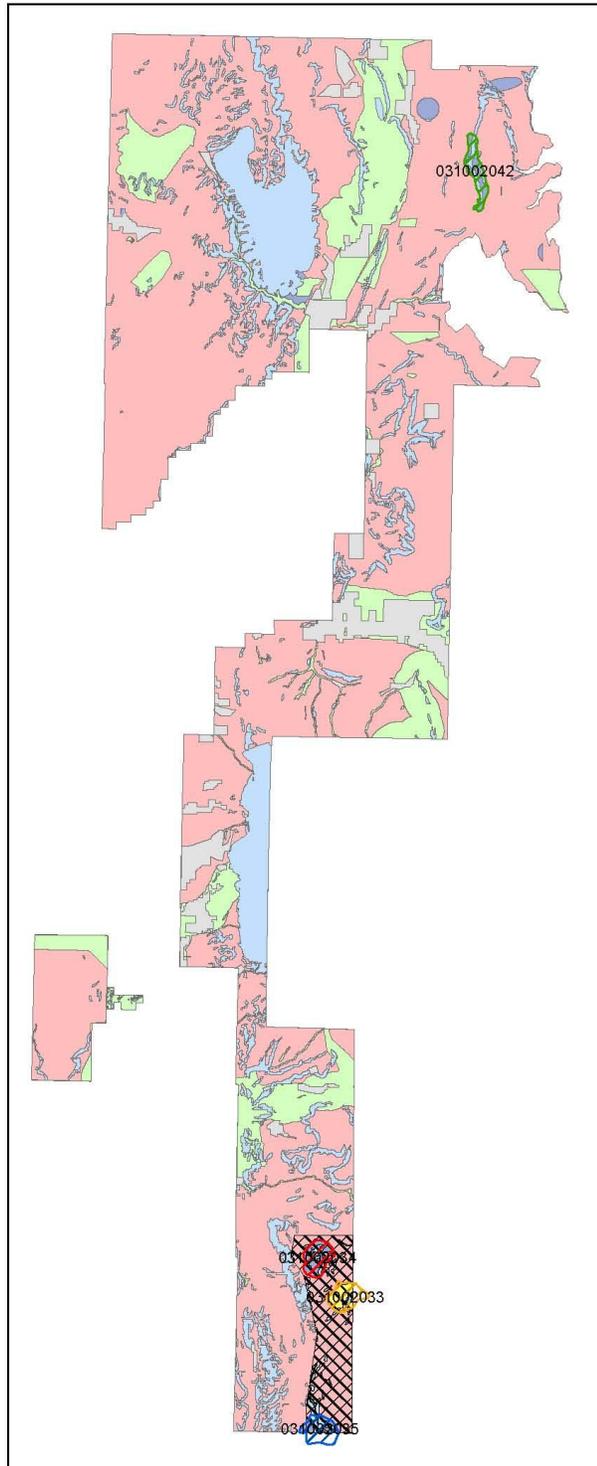
##### Action1

-  blank
-  CSU
-  NSO
-  Private
-  Standard
-  Timing

MSO_MGT_ID	Action	Acres
031002033	NSO	68.68
031002033	Timing	0.05
031002033	blank	386.49
		455.22
031002034	NSO	217.77
031002034	Timing	387.04
		604.81
031002035	CSU	16.93
031002035	NSO	143.64
031002035	Timing	205.24
		365.81
031002042	NSO	211.69
031002042	Timing	397.94
		609.63
No MSO	CSU	25,723.77
No MSO	NSO	29,718.38
No MSO	Private	11,326.15
No MSO	Standard	139,431.41
No MSO	Timing	781.27
No MSO	blank	18,684.77
		225,665.75

SFNF SO GIS, 2-20-09

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**Figure OGS-3. Mexican spotted owl protected activity centers, designated critical habitat, and locations and acreages in the study area**

There are 6,736 acres of MSO critical habitat in the southeastern end of the study area. One designated MSO PAC and portions of two other PACs totaling 1,391 acres are located within MSO critical habitat. MSO critical habitat and PAC locations would be available to perspective oil-gas lessees, information that would help them make informed decisions about oil-gas leasing. If leased, MSO surveys to protocol in the critical habitat would be required at the APD stage, and depending on survey results, a timing limitation may be imposed as a COA during the site-specific NEPA analysis.

The effects of the Proposed Action were reviewed in accordance with “Determining the Need for ESA Section 7 Re-initiation of Consultation on proposed Forest Plan Amendments and Insuring Consistency with the Region-wide Programmatic Land and Resource Management Plan Biological Opinion” (USDA Forest Service, Southwestern Region, June 15, 2005). A plan amendment is consistent with the biological opinion (BO) if:

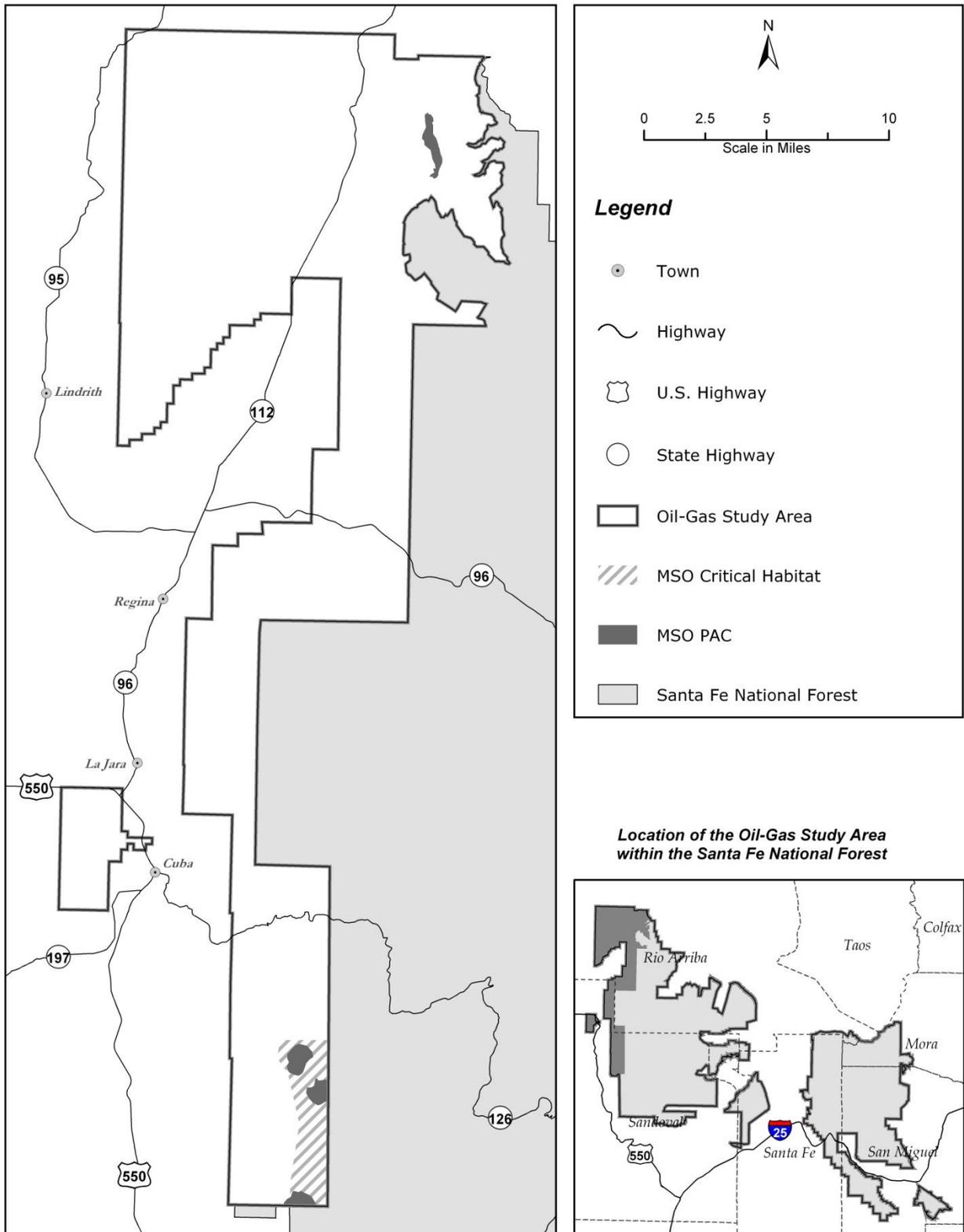
1. It results in effects (to species and/or designated critical habitat) that were analyzed in the BO;
2. It does not result in exceeding the amount of take issued in the BO;
3. It meets the assumptions stated in the BO; and,
4. It would result in continuing to implement the terms and conditions of the BO.

Although the Proposed Action would impose a timing limitation stipulation (i.e., Forest Plan standard and guideline (S&G)) on oil-gas exploration and development activities in MSO PACs within the study area, there would be no change in the effects to species and/or designated critical habitat analyzed in the biological opinion. This is because the stipulations/S&Gs clarify and establish locations where timing limitations for T&E and Forest Service sensitive species would apply. Furthermore, the Proposed Action would not change the types of oil-gas activities that may occur, and since the Forest Service has the ability to impose timing limitations for MSO under the existing Forest Plan, there would be no change in effects.

The Proposed Action does not result in exceeding the amount of take issued in the biological opinion because the stipulations/S&Gs would prohibit certain kinds of oil-gas activities during the timing limitation period that may have resulted in take; nor would it modify the rate of outputs for natural resource programs described in the Forest Plan.

The Proposed Action meets the assumptions stated in, and would continue to implement the terms and conditions for, MSO in the biological opinion because the timing limitation is designed to minimize adverse effects to reproductive and post-fledgling success during the March 1 to August 31 critical MSO nesting/breeding period. Because the locations where MSO timing limitations would be made known prior to leasing, potential lessees would be able to make informed decisions about leasing and to adjust their oil-gas activities to where the effects of such activities would be beneficial, insignificant, or discountable within occupied MSO PACs.

The Proposed Action is consistent with the regionwide programmatic LRMP biological opinion that the U.S. Fish and Wildlife Service issued on June 10, 2005 (Consultation No. 2-22-03-F-366); therefore, no re-initiation of consultation is needed on the Forest Plan as a result of this amendment.



**Figure OGS-4 Mexican spotted owl protected activity centers and designated critical habitat in the study area**

**Table OGS-15. Proposed oil-gas lease stipulations within MSO areas under the action alternatives**

MSO Area	CSU (acres)	NSO (acres)	Standard Lease Terms and Conditions (acres)	Timing Limitations (acres)
MSO PACs <sup>1</sup>	17	642	0	2,035
MSO critical habitat outside PACs	52	349	4,944	0

<sup>1</sup> The acreage sum is greater than the total amount within the study area due to overlapping lease stipulations occurring within certain PACs.

**Alternative 3**

The additional NSO lease stipulations proposed under Alternative 3 would not occur in MSO PACs or critical habitat, so the effects to MSOs and designated critical habitat would be the same as those under the Proposed Action.

Although a MSO PAC timing limitation would be imposed under all alternatives, the difference between the no action and action alternatives is that in the No Action Alternative, the timing limitation would be imposed as a COA (mitigation measure) during the site-specific NEPA analysis of the APD because there is no MSO PAC timing limitation stipulation. Under both action alternatives, the timing limitation stipulation would be known at the expression of interest stage prior to leasing, a fact that may influence oil-gas operator’s leasing decisions.

**Cumulative Impacts**

The analysis area for cumulative effects on listed or proposed threatened and endangered species and critical habitats is the area in and adjacent to the oil-gas study area, and includes both Forest Service and non-Federal lands. In all alternatives, cumulative impacts to wildlife would stem from the combination of forest management activities, public land uses, and activities on other public and private lands.

Development of leases for oil and gas resources is a reasonably foreseeable action to be considered under the “Cumulative Impacts” section. Through consultation with industry and constraints on oil-gas development, such as topography, the Forest Service projects mineral development over the next 20 years to be about 20 new well locations and almost 3 miles of associated roads within the study area. All of the projected development would occur in the northern portion of the study area. The majority of the projected wells would occur within piñon-juniper and ponderosa pine wildlife habitat (10 and 7 wells, respectively). The remaining three wells are projected to occur within grassland wildlife habitat. Associated new roads projected to be built with the projected new wells include about 1.3 miles of road within ponderosa pine wildlife habitat, 0.8 mile of road within piñon-juniper wildlife habitat, and 0.7 mile of road within grassland wildlife habitat. All of the projected wells and associated projected roads would occur within existing leases. Therefore, neither of the action alternatives would influence the development of the projected wells or roads, unless existing leases were relinquished and reissued under proposed lease stipulations. The potential oil-gas development would most likely occur under standard terms and conditions, providing minimal surface protection for vegetative

resources. The amount of projected development is minimal and, therefore, impacts to wildlife would likely be negligible.

Other foreseeable actions that may contribute to decreased wildlife habitat fragmentation and disruption are the proposed decommissioning of 773 miles of Forest Service roads within the Cuba and Coyote Ranger Districts, currently under consideration. The road decommissioning would reduce habitat fragmentation over the long term, while 639 miles of proposed road closures would reduce motorized vehicle traffic in the region and minimize wildlife disruption. Therefore, the combination of the effects of these future projects with the direct and indirect effects from this project would result in no cumulative effects to projected oil-gas development in the area.

## **Conclusions**

No direct or indirect impacts to the MSO PACs are anticipated under any alternative. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Avoidance of impacts to MSOs and designated critical habitat during development, in compliance with State and Federal laws and policy, would continue to result in no effect to MSOs and their designated critical habitat.

# Supplemental Consultation and Coordination

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### Persons, Organizations and Agencies that Were Sent Copies or Notified of the Availability of the Final Supplement to the FEIS

Persons, organizations, and agencies that received copies or otherwise requested notification of the availability of the March 2006 DEIS were sent copies or notified of the availability of this supplement, and includes Federal agencies for distribution of environmental impact statements.

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Sierra Club, Northern New Mexico Group  
WildEarth Guardians

## **State and Federal Agencies**

New Mexico Department of Game and Fish  
New Mexico Environment Department, Water Quality Bureau  
New Mexico Environment Department, Air Quality Bureau  
Advisory Council on Historic Preservation  
Environmental Protection Agency, Region 6  
Federal Aviation Administration, Southwest Region  
Federal Highway Administration  
NOAA National Marine Fisheries Service, Southwest Region  
USDA APHIS  
USDA National Agricultural Library  
USDA Natural Resources Conservation Service - Albuquerque, NM  
USDA Natural Resources Conservation Service - Washington, DC  
USDI Bureau of Land Management - Farmington  
USDI Bureau of Land Management - Santa Fe  
USDI Fish and Wildlife Service - Albuquerque  
USDI Office of Environmental Policy and Compliance  
U.S. Army Engineer Division, South Pacific  
U.S. Coast Guard  
U.S. Department of Energy

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# OGS Appendix A. MOU

**The following pages contain the Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. EPA Regarding Air Quality Analysis and Mitigation for Federal Oil and Gas Decisions Through the National Environmental Policy Act Process (June 23, 2011)**



**MEMORANDUM OF UNDERSTANDING  
AMONG THE  
U.S. DEPARTMENT OF AGRICULTURE,  
U.S. DEPARTMENT OF THE INTERIOR,  
AND  
U.S. ENVIRONMENTAL PROTECTION AGENCY,  
REGARDING AIR QUALITY ANALYSES AND MITIGATION  
FOR FEDERAL OIL AND GAS DECISIONS THROUGH  
THE NATIONAL ENVIRONMENTAL POLICY ACT PROCESS**

**PREAMBLE**

Safe and responsible domestic oil and gas production is vital to America's energy security. In facilitating oil and gas development, we must ensure that public health, safety, and environmental quality standards are met efficiently, transparently, and in a well-coordinated fashion. Through this Memorandum of Understanding (MOU), the U.S. Department of Agriculture (USDA), the U.S. Department of the Interior (DOI), and the U.S. Environmental Protection Agency (EPA) (Signatories) commit to a clearly defined, efficient approach to compliance with the National Environmental Policy Act (NEPA) regarding air quality and air quality related values (AQRVs), such as visibility, in connection with oil and gas development on Federal lands. The MOU charts a path to protect air quality and AQRVs as we move forward with responsible oil and gas development on Federal lands.

The Signatories expect this standardized approach—which builds on best practices learned from recent successful collaboration—will facilitate the completion of NEPA environmental analyses for Federal land use planning and oil and gas development decisions. The Signatories also expect it to lead to improved design and implementation of mitigation measures, including best management practices, that will both protect air quality and AQRVs, and provide opportunities for future oil and gas development.

In recent years, demand for development of oil and gas resources has increased, while at the same time air quality in some areas of intensive oil and gas development has correspondingly worsened, with some areas experiencing episodes of high levels of air pollution and negative impacts to AQRVs. Effectively addressing these issues requires clear lines of communication and close coordination among the various Federal agencies that have a role in issuing the environmental analyses associated with planning and development decisions. Specific to this process, authorities and requirements of different agencies inadvertently have contributed to heightened uncertainty for oil and gas companies proposing development on Federal lands regarding the NEPA process and have undermined prospects for timely

decisionmaking. In some instances, major oil or gas development proposals have been delayed while questions about appropriate air analyses and mitigation measures were resolved. In addition, administrative protests and lawsuits have been filed challenging air quality analyses and mitigation measures and further delaying land use plans and energy development projects. Through this Administration's focused effort to improve coordination, the agencies have developed a number of best practices that have already yielded demonstrable results in both shortening the time for planning and project decisions and in increasing efficiency for companies and Federal agencies. Through this MOU, the Signatories seek to formalize such successful processes.

Through this MOU, the Signatories are demonstrating their commitment to act collaboratively in order to protect air quality and AQRVs and facilitate the responsible development of oil and gas resources on Federal lands. The MOU will accomplish these goals by providing:

- Commitments by the Signatories' respective Agencies to collaborate throughout the NEPA process, including providing the Lead Agency with input and assistance early in the process on appropriate analyses and mitigation to address air quality and AQRVs;
- Common procedures for determining which type of air quality analyses are appropriate and when air modeling is necessary;
- Specific provisions for analyzing and discussing impacts to AQRVs and for mitigating such impacts;
- A dispute resolution process to facilitate the timely resolution of differences among the Signatories or their respective Agencies; and
- Assurances that, if the EPA determines the MOU procedures have been followed, it will rate the resulting NEPA analyses of air quality or AQRVs as "adequate" (and not "inadequate" or "3") under the EPA criteria for rating draft Environmental Impact Statements (EIS).

Through the MOU, the Signatories recognize that air resources are important, and merit protection within their respective Agencies' legal authorities. The Agencies will strive to ensure that Federal oil and gas decisions do not cause or contribute to exceedances of the National Ambient Air Quality Standards (NAAQS), nor adversely impact AQRVs in Class I Areas or sensitive Class II Areas. The MOU provides a process that will foster timely, responsible decisions on the development of oil and gas resources on Federal lands. With the signing of this MOU, the Signatories reaffirm the importance of predictable, science-based processes to protect air quality and AQRVs, provide appropriate opportunities for development of Federal oil and gas resources, and eliminate unnecessary uncertainty and delay.

## **I. PURPOSE**

The USDA on behalf of the U.S. Forest Service (FS); the DOI on behalf of the Bureau of Land Management (BLM), the Fish and Wildlife Service (FWS), and the National Park Service (NPS); and the EPA enter into this MOU. The purpose of this MOU is to set forth expectations and agreements for addressing air quality analyses and mitigation measures through the NEPA process related to Federal oil and gas planning, leasing, or field development decisions.

Air quality is important to public health and the environment. Federal statutes, including the Clean Air Act (CAA) and Federal Land Policy and Management Act (FLPMA), provide authority for protecting and improving air resources. Additionally, the National Forest Management Act (NFMA) affords the FS the opportunity to consider sustainable management of National Forest System ecosystems and the interrelationships among air, plants, animals, soil, water, and other environmental factors. Further, the Agencies with Federal land management responsibilities acknowledge that air resources are important and merit protection within their respective legal authorities. Accordingly, the Agencies will strive to ensure, to the maximum extent practicable, that Federal decisions relating to oil and gas will not cause or contribute to exceedances of the NAAQS, nor adversely impact AQRVs in Class I Areas, or sensitive Class II Areas.

In recognition of the need to balance the national mandate to protect air quality and AQRVs, human health, and the environment with the Nation's ongoing demand for energy, the Signatories have come together to create a coordinated, consistent process to evaluate and mitigate adverse impacts to air quality and AQRVs from Federal decisions relating to oil and gas activities within the NEPA process. Additional goals for the MOU are to:

- Improve collaboration and respect in conducting analyses of impacts to air quality and AQRVs and mitigating those impacts;
- Provide greater certainty and transparency for the Agencies, project proponents, and the public regarding the conduct and review of analyses of impacts to air quality and AQRVs in the NEPA process, and the application of mitigation;
- Promote and support a regional perspective on air resources, and collaborative development of appropriate regional air quality assessments; and
- Encourage both integration of design features that reduce emissions and application of cost-effective mitigation measures in projects covered by this MOU.

The Signatories recognize that Federal land management agencies must consider multiple resources when authorizing activities, and, therefore, acknowledge that air quality and AQRVs are among the many resources that must be considered in the decisionmaking process.

## II. SCOPE AND AUTHORITIES

### A. *Scope of this MOU*

1. This MOU focuses on analyzing and addressing air quality impacts (i.e., direct, indirect, and cumulative) associated with Federal decisions relating to on-shore oil and gas planning, leasing, or field development, including exploration, development, and production. This MOU is intended to refine existing Agency guidance and procedures. Specifically, the MOU establishes procedures to be followed for assessing impacts related to the NAAQS and AQRVs.
2. The MOU procedures may be used to assess emissions of hazardous air pollutants (HAPs) and greenhouse gases (GHGs), but that is not their intended purpose. However, emissions of GHGs and HAPs need to be considered, and may need to be assessed and disclosed in NEPA documents. The Agencies agree that mitigation and control measures to address the NAAQS and impacts to AQRVs often result in co-benefit reductions in GHGs and HAPs. Such reductions in GHGs and HAPs should be taken into consideration.
3. In all cases, the Agencies will follow the Council on Environmental Quality's (CEQ) NEPA regulations and guidance, as well as their own NEPA procedures.
4. The Agencies will emphasize collaboration in determining the appropriate air quality analysis under the circumstances and preparing applicable NEPA documents. Collaboration includes:
  - Informal communications among the Agencies to inform each other of issues, concerns, review schedules, etc.;
  - Timely requests for review;
  - Timely submission of review comments or the determination that providing comments is unnecessary;
  - Documentation of the results of reviews and decisions.
5. To meet the goal of promoting and supporting a regional perspective for air quality analysis, the Agencies will consider programmatic NEPA evaluations for Federal oil and gas decisions, as appropriate.
6. If disagreements arise between or among the Agencies about implementing this MOU, the affected Agencies intend to use the Dispute Resolution process in Section VII. The Agencies also are encouraged to resolve the dispute through informal discussions among higher-level decision-makers before invoking the formal Dispute Resolution process.
7. State, local, and tribal governments have authorities and responsibilities under the CAA and collaborate with Federal land management agencies and the EPA. Nothing in this MOU is intended to (a) alter or replace State, local, or tribal regulatory authorities or

responsibilities; or (b) diminish the Signatories' or the Agencies' interactions with State, local, or tribal governments.

8. The Signatories acknowledge there may be on-going efforts that address similar issues and working relationships. Those efforts are encouraged to follow the provisions of this MOU as appropriate.

*B. Authority*

The authority for the Signatories to enter into and carry out this MOU includes:

- The Clean Air Act, 42 U.S.C. 7401 *et seq.*
- The Energy Policy Act of 2005, Public Law 109-58
- The Federal Land Policy and Management Act of 1976, 43 U.S.C. 1701 *et seq.*
- The Federal Onshore Oil & Gas Leasing Reform Act of 1987, 30 U.S.C. 181 *et seq.*
- Mineral Leasing Act of 1920, as amended, 30 U.S.C. 181 *et seq.*
- National Environmental Policy Act, 42 U.S.C. 4321 *et seq.*
- National Forest Management Act, 16 U.S.C. 1600 *et seq.*
- National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee
- The National Park Service Organic Act of 1916, as amended, 16 U.S.C. 1 *et seq.*
- The Organic Administration Act of 1897, 16 U.S.C. 473-475, 477-482, 551
- Wilderness Act of 1964, 16 U.S.C. 1131 *et seq.*

### III. DEFINITIONS

Terms defined in NEPA or CEQ regulations and used in this MOU have the meaning given them in NEPA or CEQ regulations. The following terms as used in this MOU are defined as:

“Adverse impacts” is used in the NEPA context. With respect to AQRVs, it does not refer to a formal determination of “adverse AQRV impacts” under the CAA.

“Agency” or “Agencies” – the EPA or the following Agencies or Bureaus of the Signatories: the U.S. Forest Service (FS) of the USDA; and the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (FWS), and the National Park Service (NPS) of the DOI.

“Air quality or AQRVs analysis / analyses” consists of qualitative or quantitative methods for estimating impacts to the NAAQS, AQRVs, or resources, resulting from emissions as identified in the emissions inventory. Methods range from specific numerical air quality models to narrative description of physical, chemical, or transport processes.

“Air Quality Related Values (AQRVs)” – a resource, as identified by the Federal Land Manager for one or more Federal areas that may be adversely affected by a change in air

quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by the Federal Land Manager for a particular area.

“Class I Area” – as defined in Section 162(a) of the CAA (42 USC § 7472(a)), to be national parks over 6,000 acres, national wilderness areas and national memorial parks over 5,000 acres, and international parks that existed on August 7, 1977 and as designated by States and Indian tribes pursuant to their authority in Section 164 of the CAA (42 U.S.C. § 7474).

“Emissions” – direct and precursor emissions that are regulated under the CAA and its implementing regulations to reduce concentrations of criteria pollutants (ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and lead (Pb)). For purposes of analyzing impacts to AQRVs, emissions also include secondary pollutants (such as pollutants referenced in the Federal Land Managers’ Air Quality Related Values Work Group (FLAG) guidance document). GHGs are not included.

“Emission Inventory” – an accounting of the amount of emissions (as described in Section V.E.3) discharged into the atmosphere from a proposed action that influence local and regional air quality and AQRVs.

“Federal Land Manager (FLM)” – as defined in Section 302 of the CAA (42 U.S.C. §7602) and 40 CFR §51.301. Pursuant to delegated authority, for FS lands the FLM is the Regional Forester or an individual Forest Supervisor; for FWS and NPS lands the FLM is the DOI Assistant Secretary for Fish and Wildlife and Parks.

“Greenhouse Gases (GHG) Emissions” – emissions of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride).

“Lead Agency” – as defined in 40 CFR §1508.16.

“National Ambient Air Quality Standards (NAAQS)” – as defined in the CAA (42 U.S.C. § 7409) and 40 CFR Part 50.

“Prevention of Significant Deterioration (PSD) Increment” – the maximum allowable increases in ambient pollution concentrations allowed over baseline concentrations established under Sections 163 and 166 of the CAA. (See 40 CFR §51.166 (c) for increments for specific pollutants.)

“Proximity” – as determined by the Lead Agency on a case-by-case basis after conferring with the other Agencies and considering the Agencies’ applicable guidance.

“Reasonably foreseeable number of wells” – the number of oil and gas wells that could reasonably be expected to be developed during exploration, development, and production activities in a specified planning, leasing, or project area, consistent with applicable guidance including the *Interagency Reference Guide Reasonably Foreseeable Development Scenarios*

*And Cumulative Effects Analysis For Oil and Gas Activities On Federal Lands In the Greater Rocky Mountain Region*, dated June 2003.

“Sensitive Class II Area” – for purposes of this MOU is an area identified by the affected Agency on a case-by-case basis.

“Substantial Increase in Emissions” – as determined by the Lead Agency on a case-by-case basis after conferring with the other Agencies. In making its determination, the Lead Agency will consider:

- The Emissions Inventory prepared pursuant to Section V.E.3;
- Whether an increase in the emissions related to the proposed action, based on best professional judgment, may cause or contribute to exceedances of the NAAQS or adversely impact AQRVs in Class I areas or resources in sensitive Class II areas; and
- FLAG guidance or other guidance if applicable to the Lead Agency.

#### **IV. ROLES AND RESPONSIBILITIES**

##### *A. Bureau of Land Management*

The BLM administers more than 245 million surface acres in the National System of Public Lands and 700 million acres of Federal subsurface mineral estate underlying lands owned and managed by other entities, including other Federal agencies and state and private landowners. The BLM manages the public lands on the basis of the “multiple-use” and “sustained yield” mandate described in FLPMA, which directs the BLM to manage the public lands in a manner that will protect the quality of air and atmospheric values, among others. In addition, in developing land use plans, the BLM must provide for compliance with applicable state and Federal pollution control laws, including those addressing air (such as the CAA). Consistent with FLPMA, anyone using, occupying, or developing the public lands must comply with applicable state and Federal pollution control laws, including the CAA. The BLM has responsibility, under the CAA, for Class I Areas that it manages.

##### *B. Environmental Protection Agency*

The EPA is responsible for reviewing and commenting on NEPA documents, particularly EISs, pursuant to NEPA and the EPA’s specific authorities under Section 309 of the CAA. Additionally, the EPA administers the programmatic and regulatory aspects of the CAA. The EPA sets the NAAQS, develops and promulgates CAA implementing regulations, oversees State and tribal CAA regulatory programs, and issues CAA permits, where appropriate.

##### *C. Forest Service*

The FS is responsible for the surface management of 193 million acres of National Forest System lands, portions of which are covered by Federal oil and gas leases that grant exclusive rights for exploration and development. The FS also evaluates National Forest

System lands for potential oil and gas leasing. The 1977 CAA Amendments protect visibility and other AQRVs in Class I areas from the adverse impacts of air pollution. The FS reviews permit applications and NEPA documents, for new or expanding industrial facilities and activities proposing to construct on or near FS administered lands, to determine whether air pollution from these sources would have an effect on FS administered lands.

*D. Fish and Wildlife Service and National Park Service*

The FWS and NPS are responsible for the surface management of 150 and 84 million acres, respectively, of National Wildlife Refuge and National Park System lands. The 1977 CAA Amendments give FWS an affirmative responsibility to protect visibility and other AQRVs of Class I wilderness areas under its jurisdiction from the adverse impacts of air pollution. Similarly, the 1977 CAA Amendments give NPS an affirmative responsibility to protect visibility and other AQRVs of Class I national parks and wilderness areas under its jurisdiction from the adverse impacts of air pollution. In addition, the National Wildlife Refuge Systems Improvement Act, the National Park Service Organic Act, and associated Management Policies require FWS and NPS to protect the AQRVs of all of their lands, including both Class I and Class II areas, for the enjoyment of future generations. The FWS and NPS meet these responsibilities by reviewing permit applications and NEPA documents for new or expanding industrial facilities and activities proposing to construct on or near NPS or FWS administered lands. As part of this review, FWS and NPS determine whether air pollution from these sources would have an adverse effect on FWS or NPS administered lands.

**V. AIR QUALITY AND AQRVS ANALYSES**

- A. The Signatories will collaborate to implement this MOU. The analysis of impacts to air quality and AQRVs will be conducted in accordance with current technical standards, guidance, and practices and will be used to inform the decisionmaker, the Agencies, and the public. The Lead Agency should use existing analyses to the extent practicable.
- B. When preparing an EIS for a Federal oil and gas decision, a Lead Agency will follow the procedures in this MOU and the Appendix for the air quality and AQRVs analyses. When preparing an Environmental Assessment for a Federal oil and gas decision where air quality or AQRVs are issues warranting NEPA analysis, the Lead Agency will consider following the procedures established in this MOU and the Appendix.
- C. Technical work groups can facilitate communication and share expertise for conducting air quality and AQRVs analyses early in the NEPA process.
  1. When the Lead Agency determines through NEPA scoping, that air quality or AQRVs will be significantly impacted by a proposed action, the Lead Agency will convene a technical workgroup for that proposed action composed of the Agencies to provide advice about the analysis. The Agencies will assign appropriate staff, who will fully participate in the technical workgroup, which will establish a work plan, consistent with the Lead Agency's schedule, for circulating and reviewing appropriate work products.

2. If air quality or AQRVs are a concern, but will not be significantly impacted by a proposed action, the Lead Agency may convene a technical workgroup. Alternatively, an Agency may ask the Lead Agency to convene a technical workgroup in those circumstances.
  3. The Lead Agency may rely on an existing stakeholder group that complies with the Federal Advisory Committee Act (FACA), as appropriate, or include cooperating agencies in a technical workgroup, provided the technical workgroup meets the requirements established in Section V.C.1. above.
- D. Consistent with NEPA and its implementing regulations, the Lead Agency will complete and document supporting air quality and AQRVs analyses prior to Federal oil and gas planning, leasing, or field development decisions.

1. If the Lead Agency cannot complete necessary quantitative analyses (e.g., if a reasonably foreseeable number of wells cannot be determined, see V.E.1), it will include in the appropriate NEPA documents:
  - A qualitative narrative description of the air quality issues or impacts;
  - A statement of when more detailed information will likely be available; and
  - A commitment to complete the air quality and AQRVs analyses once the requisite information is available.
2. If the Lead Agency encounters a situation involving incomplete or unavailable information as defined in 40 CFR §1502.22, it will follow that provision and its own NEPA procedures.

E. Procedures For Assessing Impacts to Air Quality and AQRVs

1. Early in the NEPA process, the Lead Agency will discuss with the Agencies:
  - a. Information about the affected environment to include in the baseline assessment;
  - b. Methodology, assumptions, and scale (e.g. local or regional) of the analyses;
  - c. Monitoring protocols and mitigation (see Section VI).

As early as possible in its planning process, the Lead Agency will identify the reasonably foreseeable number of oil or gas wells that can be expressed as a range, expected to be located within the planning area. Existing reasonably foreseeable development scenarios can be used to identify the number of wells.

2. Once the Lead Agency identifies the reasonably foreseeable number of oil or gas wells, it will prepare an Emissions Inventory of criteria pollutants and volatile organic

compounds. The Lead Agency will use the Emission Inventory to analyze whether modeling is required as provided in V.E.3 below.

3. Except as provided in V.E.4 below, the Lead Agency will conduct modeling to assess impacts to air quality and/or AQRVs if a proposed action meets at least one of the criteria in subparagraph (a) *and* at least one of the criteria in subparagraph (b) below:
  - a. *Emissions/Impacts* - the proposed action:
    - Is anticipated to cause a Substantial Increase in Emissions based on the Emissions Inventory prepared pursuant to Section V.E.2; or
    - Will materially contribute to potential adverse cumulative air quality impacts as determined under NEPA.
  - b. *Geographic Location* - the proposed action is in:
    - Proximity to a Class I or sensitive Class II Area; or
    - A Non-Attainment or Maintenance Area; or
    - An area expected to exceed the NAAQS or PSD increment based on:
      - Monitored or previously modeled values for the area;
      - Proximity to designated Non-Attainment or Maintenance Areas; or
      - Emissions for the proposed action based on the Emissions Inventory prepared pursuant to Section V.E.2.
  - c. Modeling will be conducted as described in the Appendix. If multiple approved models, or a completed regional air quality assessment, can provide equivalent information, the Lead Agency will choose the appropriate approach or approaches.
4. Modeling will not be required in the following circumstances:
  - a. If the Lead Agency demonstrates and the EPA, and the Agencies whose lands are affected, concur (in writing or by electronic transmission) that, due to mitigation or control measures or design features that will be implemented, the proposed action will not cause a Substantial Increase in Emissions. The demonstration will describe the proposed features or measures, the anticipated means of implementation, and the basis for the conclusion that the proposed action will not cause a Substantial Increase in Emissions.
  - b. If the EPA and the Agencies whose lands are affected concur (in writing or by electronic transmission) that:
    - An existing modeling analysis addresses and describes the impacts to air quality and AQRVs for an area under consideration, and

- The analysis can be used to assess the impacts of the proposed action.

5. If modeling is not required because either:

- The Section V.E.3 criteria above *have not been* met, or
- one of the circumstances in Section V.E.4 above *has been* met,

the Lead Agency will document its decision not to model and include a qualitative narrative analysis of the impacts to air quality and AQRVs in the appropriate NEPA documents.

6. Additional Procedures for AQRVs

a. When the BLM is the Lead Agency, the BLM will apply:

1. The BLM threshold values and methodologies assessing impacts to AQRVs on BLM administered lands, unless otherwise determined by the BLM; and
2. The threshold values and methodology in the FLAG guidance assessing impacts to AQRVs on FS, FWS, NPS administered lands, or other guidance accepted by FS, FWS, or NPS.

b. When FWS, NPS, or FS is the Lead Agency, the Lead Agency will apply:

1. The threshold values and methodology in the FLAG guidance assessing impacts to AQRVs on FS, FWS, NPS administered lands, or other guidance accepted by FS, FWS, or NPS; and
2. The BLM threshold values and methodologies assessing impacts to AQRVs on BLM administered lands, unless otherwise requested by BLM.

c. The Lead Agency will identify, consider, and discuss in the body of the NEPA document:

1. Analysis results for the threshold values assessed, as stated in Section V.E.6 (a) and (b) above, to facilitate comparison of the results;
2. The Agencies' views about: (a) the nature of impacts to AQRVs on the affected Agencies' land and (b) potential mitigation measures.

F. The Agencies will comply with the General Conformity requirements under CAA Section 176 (42 U.S.C. § 7506) and the corresponding regulations at 40 CFR § 93.150, *et seq.*, where applicable.

G. For informational purposes, the Lead Agency will calculate, and disclose in the NEPA document, PSD increment consumption from the proposed action at Class I Areas.

Further evaluation may need to be performed under applicable statutory or regulatory requirements if an affected Class I Area has known increment violations.

- H. The procedures in Section V of this MOU are designed to ensure that adequate air quality and AQRVs analyses will be prepared for NEPA documents. For purposes of this Section H, the term air quality relates solely to Emissions associated with achieving the NAAQS and impacting AQRVs (as those terms are defined in Section III). Emissions of HAPs and GHGs are not included within the scope of this Section H, and the term air quality as used in this Section H.

If the EPA determines that the MOU procedures have been followed for an EIS, it will find that the air quality or AQRVs analysis is adequate. However, any future laws, regulations or policies may require additional analyses beyond those contemplated by this MOU. In addition, the EPA may determine that an EIS presents inadequate discussions of proposed mitigation or control measures or design features to address adverse impacts to air quality or AQRVs, or inadequate analysis of impacts to resources other than air. Further, because adequate analyses do not mean that the impacts will be environmentally satisfactory, the EPA will continue to convey its views on the environmental soundness of respective actions in the comment letters it issues pursuant to NEPA and Section 309 of the CAA. Moreover, as required by Section 309 of the CAA, if EPA determines that the effects of a Federal oil or gas action are unsatisfactory from the standpoint of public health or welfare or environmental quality, it will refer the action to the CEQ.

## **VI. MITIGATION AND EMISSIONS REDUCTIONS**

- A. The Lead Agency, in collaboration with the other Agencies as provided in Section V.E.1, will identify reasonable mitigation and control measures and design features to address adverse impacts to air quality or AQRVs on all affected lands in the NEPA process. Mitigation and control measures can include: best management practices, control technologies, and pace of development.
- B. The Lead Agency will evaluate the reasonable mitigation and control measures and design features to eliminate or reduce adverse impacts to air quality or AQRVs identified in the NEPA process.
- C. The Lead Agency will determine the appropriate mitigation and control measures and design features to (1) eliminate or reduce adverse impacts to air quality or (2) eliminate or reduce adverse impacts to AQRVs (including on other Agencies' lands), and describe them in the NEPA decision document.
- D. As provided for by law and consistent with lease rights and obligations, the Lead Agency will:
- Ensure implementation of reasonable mitigation and control measures and design features through appropriate mechanisms, including lease stipulations and conditions of approval, notices to lessees, and permit terms and conditions;

- Take appropriate steps to retain the flexibility to implement additional reasonable mitigation and control measures and design features for permitted operations;
  - Work to implement additional reasonable mitigation and control measures and design features to reduce future emissions from permitted operations.
- E. The Lead Agency will consider adopting a monitoring and enforcement program to verify that mitigation and control measures and design features are achieving their intended purposes. Monitoring should be conducted in cooperation with stakeholders.
- F. If the Lead Agency determines that mitigation and control measures and design features are not achieving their intended purposes, it will take appropriate action, consistent with applicable law and lease rights and obligations.

#### **VII. DISPUTE RESOLUTION**

- A. The Signatories will resolve expeditiously all disputes related to this MOU. Disputes will be raised and resolved in a timely manner with due consideration to the projects or other activities impacted by the dispute.
- B. The Signatories encourage communication and joint problem solving to recognize and deal with disputes as they arise and to maintain constructive interagency relationships.
- C. Decisionmaking will occur at the lowest level possible by staff with specific knowledge and relevant experience. Unresolved issues will be elevated quickly to higher-level decisionmakers to apply a broader policy perspective as needed.
- D. The Agencies agree to the following dispute resolution process if a dispute arises between or among any of them relating to implementation of this MOU.
1. Level One: The Agency that seeks resolution will provide a written statement of the dispute to the involved Agencies' Level One contacts identified in Section IX. The written statement will include the following: a brief summary of the dispute, a brief statement of each issue that needs to be resolved or decided, up to three proposed solutions including the reasons these solutions are important, and supporting documentation. The Agencies involved in the dispute will engage in discussions and attempt to arrive at a consensus resolution of the dispute.
  2. Level Two: If resolution is not reached within 15 working days of receipt of the statement of dispute, the dispute may be elevated by written notice to the involved Agencies' Level Two contacts identified in Section IX. The written notice will include: a brief summary of the dispute, a brief statement of each issue that needs to be resolved or decided, a brief description of the Level One efforts to resolve the issue(s) and the reasons those efforts were unsuccessful, and the perspectives of the other Agencies on the dispute, outstanding issues, and previous efforts to reach a resolution. Each Agency involved in the dispute will prepare a brief paper describing the issue, background information, needs and concerns, and options from their perspective. The Level Two decision-makers will meet, discuss the issue(s), and seek

consensus resolution. The Agency that seeks resolution also may schedule a joint briefing of all relevant Agencies.

3. Level Three: If consensus is not reached by the Level Two officials within 30 working days of receipt of the written notice of dispute, the Agencies involved in the dispute will elevate the matter to the principal policymakers at headquarters for the respective Signatories (Level Three contacts identified in Section IX), who will endeavor to resolve the issue(s) within 30 working days.
4. The Agencies involved in the dispute will include appropriate agency expertise, including NEPA experts, in the discussions and use a discussion format that provides for orderly and direct communication and consideration of the range of agency perspectives.
5. The above time limits may be extended by written agreement of the parties to the dispute. The Agencies involved in the dispute may employ agency dispute resolution services to assist in the resolution of the dispute. States or tribal governments may participate in discussions to resolve the matter with the consent of all the parties to the dispute.

#### **VIII. ADMINISTRATIVE PROVISIONS**

- A. Nothing in this MOU is intended or will be construed to limit, expand, or affect in any way the authority or legal responsibilities of the Agencies.
- B. Nothing in this MOU may be construed to obligate the Agencies or the United States to any current or future expenditure of resources in advance of the availability of appropriations from Congress. Nor does this Agreement obligate the Agencies, or the United States, to spend funds on any particular project or purpose, even if funds are available.
- C. The mission requirements, funding, and staffing of the Agencies may affect their ability to fully implement all of the provisions of this MOU.
- D. Specific activities that involve the transfer of money, services, or property between or among the Agencies (1) will require execution of separate agreements or contracts, (2) will be contingent upon the availability of funds, and (3) must be independently authorized by appropriate statutory authority. This MOU does not provide such authority. Negotiation, execution, and administration of each such agreement must comply with all applicable statutes and regulations.
- E. The Signatories and their respective Agencies and offices will handle their own activities and utilize their own resources, including the expenditure of their own funds, in pursuing these objectives. Each Agency will carry out its separate activities in a coordinated and mutually beneficial manner.

- F. Nothing in this MOU is intended or will be construed to restrict the Signatories or the Agencies from participating in similar activities or arrangements with other public or private agencies, organizations, or individuals.
- G. This MOU is not intended to, and does not, create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.
- H. Any information furnished between the Agencies under this MOU may be subject to the Freedom of Information Act, 5 U.S.C. § 552, *et seq.*, including provisions for interagency consultation with the originating agency before making a direct FOIA response.
- I. All press releases and public statements issued by the Signatories concerning or characterizing this MOU will be jointly reviewed and agreed to by delegated staff representing each of the undersigned Signatories.
- J. This MOU may be amended or modified only through written agreement among all of the Agencies, signed by the Secretaries and Administrator or their respective delegates. Other Federal and state agencies may become signatories to this MOU with the written consent of all the Agencies.
- K. In addition to the annual review in Section X.B, the Signatories will review this MOU at least every five (5) years for adequacy, effectiveness, and continuing need.
- L. The Agencies will comply with FACA (5 U.S.C. Appendix 2) to the extent it applies.

**IX. PRINCIPAL CONTACTS**

Each Signatory hereby designates the following Federal employees as the principal contacts regarding this MOU. The contacts may be changed through written notice to each Signatory.

	<b>Level One</b>	<b>Level Two</b>	<b>Level Three</b>
<b>BLM</b>	State Director	Bureau Director	Assistant Secretary
<b>EPA</b>	Regional Division Director	Regional Administrator	Assistant Administrator
<b>FS</b>	Regional Forester	Chief	Under Secretary
<b>FWS</b>	Associate Director	Bureau Director	Assistant Secretary
<b>NPS</b>	Associate Director	Bureau Director	Assistant Secretary

**X. MOU TERM, IMPLEMENTATION, AND APPLICABILITY**

- A. *Effective Date and Term.* This MOU is effective on the date of the last approving Signatory’s signature. This MOU will remain in effect unless amended or terminated.
- B. *Implementation.* Within 90 days of the effective date, BLM, EPA, FS, FWS, and NPS will coordinate to:

- Develop Agency and joint plans for implementing and disseminating this MOU,
- Develop appropriate joint training efforts and materials, and
- Designate national senior level managers to oversee implementation of this MOU.

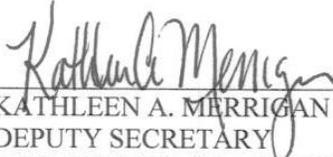
The designated senior level managers will approve the MOU implementation plans. They will meet annually to confirm the effectiveness of the MOU and discuss and document any challenges, concerns, or opportunities for improvement.

*C. Applicability.*

1. This MOU applies to all NEPA analyses commencing after the effective date, as provided in Section V.B.
2. This MOU applies to on-going NEPA analyses for which a draft NEPA document (e.g., draft EIS, completed EA / unsigned FONSI) will not be issued for public review within 90 days following the effective date of the MOU. However, the provisions of Section V.H. are not available to NEPA analyses if the MOU procedures have not been followed.
3. The Agencies also will consider applying the MOU to on-going NEPA analyses where comments on the draft have questioned the adequacy of the air quality or AQRVs analysis, if such analysis can be accomplished in a cost-effective and timely manner.

*D. Termination.* This MOU will be terminated when it is no longer required. In addition, a Signatory may terminate participation in this MOU 90 days after providing written notice to the other Signatories.

**XI. SIGNATURES**

By:   
KATHLEEN A. MERRIGAN  
DEPUTY SECRETARY  
DEPARTMENT OF AGRICULTURE

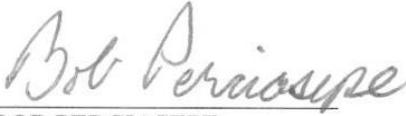
JUN 23 2011

Date: \_\_\_\_\_

By:   
DAVID J. HAYES  
DEPUTY SECRETARY  
DEPARTMENT OF THE INTERIOR

JUN 23 2011

Date: \_\_\_\_\_

By:   
BOB PERCIASEPE  
DEPUTY ADMINISTRATOR  
ENVIRONMENTAL PROTECTION  
AGENCY

JUN 23 2011

Date: \_\_\_\_\_

**Attachments:**

Appendix:

- Modeling Approaches to Evaluate Air Quality for NEPA Decisions Regarding Federal Oil & Gas
- Modeling Approach Tables for Oil & Gas Development through the NEPA Process
- Overview Matrix Of Air Quality Model Characteristics

Concept Paper – Overview and Example Design of a Reusable Modeling Framework for Air Quality Modeling

June 20, 2011

**APPENDIX TO MEMORANDUM OF UNDERSTANDING  
AMONG THE U.S. DEPARTMENT OF AGRICULTURE, U.S. DEPARTMENT OF THE INTERIOR, AND  
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGARDING AIR QUALITY ANALYSES AND  
MITIGATION FOR FEDERAL OIL AND GAS DECISIONS THROUGH THE NEPA PROCESS  
(06/20/11)**

**MODELING APPROACHES TO EVALUATE AIR QUALITY FOR  
NEPA DECISIONS REGARDING FEDERAL OIL & GAS**

The purpose of this Appendix is to provide information when modeling is required by Section V.E.3.c of the Memorandum of Understanding (MOU). Section V.A of the MOU says "The analysis of impacts to air quality and AQRVs will be conducted in accordance with current technical standards, guidance, and practices and will be used to inform the decision-maker, Agencies [BLM, EPA, Forest Service, FWS, and NPS], and the public." Section V.D. of the MOU says "[c]onsistent with NEPA and its implementing regulations, the Lead Agency will complete and document supporting air quality and AQRVs analyses prior to Federal oil and gas planning, leasing, or field development decisions."

Modeling is required when criteria described in MOU Section V.E.3 are met. This appendix provides general direction on approaches, models, and underlying principles to accomplish technical tasks while encouraging and optimizing resource efficiencies. Initially some of the modeling efforts may require additional investments. However, the outlined approaches encourage, to the maximum extent practicable, the reuse of pre-existing major modeling components and data to reduce overall resource commitments over time.

The Appendix is comprised of this introduction, and these two additional components:

- Two tables (A and B) of general air quality analysis approaches for a variety of conditions (e.g., planning phase, data quantity/quality, and potential air quality impacts); and
- A matrix summarizing characteristics of currently available air quality models, applicability, and references (Overview Matrix Of Air Quality Model Characteristics).

Also attached is a concept paper describing a Reusable Modeling Framework, which provides an example of a complex air quality modeling system designed for multiple uses.

Consistent with the provisions of Section V. of the MOU, the Lead Agency selects the appropriate air quality models and technical approaches. Nevertheless, the Lead Agency must collaborate and engage the Agencies and technical workgroups, if convened, in selecting air quality models and technical approaches (see MOU Sections V.A., V.C. and V.E.1.). Early use of the approaches outlined in this Appendix will assist in making air quality modeling more efficient, effective, and save time and expense.

NOTES: (1) If the Lead Agency cannot complete necessary quantitative analyses (e.g. if a reasonably foreseeable number of wells cannot be determined, see MOU Section V.E.1), the Lead Agency should follow the procedures in MOU Section V.D. (2) This Appendix supports implementation of the MOU and does not supersede the provisions and process established in the MOU. (3) If disputes arise about application of the Appendix, follow the MOU dispute resolution provisions (Section VII). (4) This Appendix may be updated to reflect current knowledge and science as provided in the MOU.

The following tables describe various analysis approaches:

- Table A is used when the Lead Agency has determined a reasonably foreseeable number of wells utilizing limited or general information. The number of wells or associated emissions can be expressed as a range (e.g., low, medium, high).
- Table B is used when the Lead Agency has determined a reasonably foreseeable number of wells (e.g., specific number and location).

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APPENDIX TO MOU (06/2011)

**Table A. Consult this table when:**

A reasonably foreseeable number of oil or gas wells and associated emission inventory has been developed, utilizing limited or general information, the reasonably foreseeable number of wells and associated emissions are expressed as a range (e.g., low, medium, high).

Long Range Transport Assessment Approach	'Add-on' Photochemical Approach	Local Assessment Approach
<p><b>When:</b> Actions that contain single (or small group) source scenarios. Conductive to providing regional assessments of cumulative and incremental impacts. Transport distances greater than 50km.</p> <p><b>Description:</b> Conduct modeling with estimates of emissions and estimated meteorological and geographic information for single or small groups of sources. This analysis may be used for new projects or proposals that lack specific development information but contain source scenarios that warrant additional review. This approach utilizes EPA guideline approved models for near (local) and far-field analysis. Models tend to be specific to an AQ pollutant, approved purpose, and regulatory application. Impact estimates are generated for ambient concentration, atmospheric deposition, and AQRVs.</p> <p><b>Note:</b> Additional narrative may be necessary to describe how uncertainties affect air quality impact estimates.</p> <p><b>Models:</b> Long range transport models such as CALPUFF, SCIPUFF</p>	<p><b>When:</b> Actions that contain large scale source scenarios. Conductive to providing regional assessments of cumulative and incremental impacts.</p> <p><b>Description:</b> Conduct regional scale modeling with estimates of emissions and estimated meteorological and geographic information with complex photochemical processes. This analysis may be used for new projects or proposals that lack specific development information but contain large scale or complex photochemical source scenarios that warrant additional review. For this approach, reasonable estimates of incremental emissions are reentered into an existing photochemical modeling system to fully assess impacts based on reasonably foreseeable scenarios.</p> <p><b>Note:</b> Additional narrative may be necessary to describe how uncertainties affect air quality impact estimates.</p> <p><b>Models:</b> Photochemical models such as CMAQ, CAMX</p>	<p><b>When:</b> Actions likely to result in local air quality impacts. Transport distances less than 50km.</p> <p><b>Description:</b> Conduct local scale modeling analysis with emission estimates, meteorological, and geographic information for single sources. May be used when local AQ impact potential is great. Must consider the uncertainties associated with running near-field models with limited or general information.</p> <p><b>Note:</b> Additional narrative is likely to be needed to describe air quality issues, emission uncertainties, and their affects on estimated impacts. Commitment to complete additional analysis may be necessary when requisite information becomes available.</p> <p><b>Models:</b> AERMOD / AERSCREEN, VISCREEN, PLUVUE II, CALPUFF</p>

\*An overview of model characteristics can be found in the following Matrix of Air Quality Modeling Characteristics.

APPENDIX TO MOU (06/20/11)

<b>Table B: Consult this Table When</b>	
<b>A reasonably foreseeable number of oil or gas wells (e.g., specific number and location) and associated emission inventory has been developed.</b>	
Dispersion Model Approach	'Add on' Photochemical Approach
<p><b>When:</b> For criteria pollutants, toxics/HAPs, AQRVs (FLAG), small-medium scale &amp; number of sources, EPA guideline (regulatory), screening &amp; refined modeling options.</p> <p><b>Description:</b> Conduct modeling with project specific emission, meteorological, and geographic information.</p> <p>This approach recommends EPA guideline models, or alternative models that meet Appendix W guidelines on model applications for near (local) and far-field analysis. Models tend to be specific to an AQ pollutant, approved purpose, and regulatory application. Impact estimates are generated for ambient concentration, atmospheric deposition, and AQRVs.</p> <p>Although these models make up the primary air quality modeling tool chest, most do not handle complex scenarios, advanced chemical reactivity, or large numbers of sources commonly associated with regional scale oil &amp; gas development.</p> <p>This modeling approach is the current state-of-practice and is likely for most project specific AQ impact assessments. Re-use of domains, meteorology, and file configuration minimizes resources and costs.</p>	<p><b>When:</b> Projects or plans with large geographic extent, large number of sources, or present complex issues with ozone and secondary particulate impacts.</p> <p><b>Description:</b> Conduct regional scale modeling with project specific emission, meteorological, and geographic information with complex photochemical processes.</p> <p>This approach utilizes a regional scale 'one atmosphere' simulation of a wide variety of AQ pollutants with a large geographic extent. Emissions are gridded, allow for chemical transformation, and offer a variety of transportation mechanisms to address near and far-field transport. Impact estimates are generated for ambient concentration, atmospheric deposition, and AQRVs.</p> <p>'Add on' means to insert project specific incremental emission estimates into an existing regional scale modeling system. Re-use of existing baseline inventories, meteorology, and model setup greatly reduce resources necessary for model application.</p> <p>The 'Add on' photochemical approach is anticipated to become the state-of-practice in coming years.</p>
<p><b>Models:</b> AERMOD / AERSCREEN, VISCREEN, PLUVUE II, CALPUFF, SCIPUFF</p>	<p><b>Models:</b> CMAQ, CAMX</p>
<p><b>Maximizing resources, time, and costs:</b> Lead Agencies are encouraged to develop and utilize modeling methods that promote optimal resource efficiencies. Early planning often can result in datasets (meteorology, emissions, etc.), modeling systems, and analysis outputs that can be applied to a broad range of agency actions requiring air quality models. Reusing aspects of air quality modeling results in substantial time and cost savings, especially with repetitive similar applications. Early modeling considerations substantially reduce modeling development requirements in all subsequent project development phases. Modeling systems that evaluate varied growth patterns (expressed in the form of low, medium, and high) offers reuse potential for both results and modeling systems. An example of a Reusable Modeling Framework (RMF) with emphasis on growth patterns using a complex photochemical model is found in the RMF example attached to this Appendix. The RMF concept could be applied to additional models, domains, and agency actions. MOU Section V.E.4.b describes criteria to eliminate air quality modeling requirements based on availability of existing modeling.</p>	

\*An overview of model characteristics can be found in the following Matrix of Air Quality Modeling Characteristics.

APPENDIX TO MOU (06/20/11)

OVERVIEW MATRIX OF AIR QUALITY MODEL CHARACTERISTICS

	Near Field (<50km)			Long Range Transport (>50km) & Photochemical Models		
	AERSCREEN	VISCREEN/PLUVUE II	AERMOD	CALPUFF	SCIPIUFF**	CMAQ/CAMX
<b>Description</b>	A conservative single-source screening model based on AERMOD for NAAQS and PSD permitting.	Plume blight models for AQRVs and PSD permitting. Visual impacts are estimated by detailing change in color and contrast along a specific view.	Refined single/cumulative regulatory model for NAAQS, toxics, and PSD. Used for non-reactive criteria pollutants.	Refined long range transport model for AQRVs, NAAQS, and PSD increment. Contains simplified chemical processes.	Refined (alternative) long range model for NAAQS and PSD increment. Contains more advanced chemical processes.	Refined photochemical model with full chemistry. Urban to regional scale model capable of single source or cumulative impact assessments.
<b>Advantages</b>	Quick, easy to setup, and simple operation.	VISCREEN: Quick, easy operation and results. PLUVUE II: Complex blight analysis.	Most widely accepted regulatory model. Extensive documentation/guidance for appropriate use.	Ability to simulate pollutant transport that varies in time and space. Addition of simple chemistry and deposition.	Ability to simulate pollutant transport that varies in time and space. Addition of advanced chemistry.	Primary models for ozone and secondary particulate matter impact. Includes most realistic chemistry.
<b>Disadvantages</b>	Conservative modeling assumptions and results.	Single purpose models with lack of robust guidance.	Not suitable for ozone or AQRV impact analyses.	Numerous model control options, difficult validation, and long run times.	Not widely available and not extensively documented.	Complex setup and operation. Advanced computing requirements.
<b>Required computer resources</b>	Light (laptop)	Light (laptop)	Light/Moderate (PC)	Moderate (robust PC)	Moderate (robust PC)	Heavy (UNIX, cluster)
<b>Required model input data</b>	Pre-set meteorology.	Pre-set meteorology or National Weather Service observations.	National Weather Service or on-site observations.	3-Dimension meteorology	3-Dimensional meteorology	3D meteorology, heavy emissions processing.
<b>Range of costs*</b>	In-house to minimal	In-house / \$10K - \$75K	\$10K - \$30K	\$10K - \$50K	\$10K - \$75K	\$50K - \$100K
<b>Factors affecting costs</b>	None	None/Multiple runs	runtime	Meteorology, runtime	Meteorology, runtime	Multiple inputs, runtime
<b>Time to set up, run model</b>	Minutes	Minutes / 1-2 weeks	1-2 Weeks	Days to weeks	Weeks	Weeks to months
<b>Model Developer</b>	EPA	EPA/EPA	EPA	TRC	Lakes Environmental	EPA/Environ
<b>Background, references</b>	40CFR51AppxW	FLAG, 40CFR51AppxW	40CFR51AppxW	FLAG, 40CFR51AppxW	Private	EPA SIP guidance

\* Does not include development of baseline emissions (present or future), meteorological inputs, or contract management. Initial development costs may be more.  
 \*\* SCIPIUFF is considered an alternative model under 40 CFR 51 Appx. W but may be considered for long range transport use on a case-by-case basis.

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## OVERVIEW AND EXAMPLE DESIGN OF A REUSABLE MODELING FRAMEWORK FOR AIR QUALITY MODELING

**Note to Readers:** *This example of an 'Add-on' air quality modeling approach is intended to highlight a strategy for the development of air quality modeling products that can be used at the various stages in National Environmental Policy Act (NEPA) documents (refer to Modeling Approach Tables (Tables A and B) in the MOU Appendix). This framework is not intended to be prescriptive, but an example that could be adapted to reflect project specific information.*

*This framework is intended to promote the development of air quality modeling analysis in a manner that reduces overall resource expenditures through reuse of data, modeling systems, or results. With early consideration, modeling systems can generate input datasets or become the foundation of future applications with simple modification. In some situations, an existing modeling analysis may fulfill the requirements of the MOU that states: 'Modeling will not be required...[i]f EPA and the Agencies whose lands are affected concur (in writing or by electronic transmission) that: an existing modeling analysis addresses and describes the impacts to air quality and AQRVs for an area under consideration, and the analysis can be used to assess the impacts of the proposed action.' (Section V.E.4.b).*

### Conceptual Description

For the purposes of this document, a Reusable Modeling Framework (RMF) refers to an existing air quality modeling analysis with underlying emission inventories, regional meteorology, and appropriate growth factors (oil/gas emissions) that are considered applicable to a new or modified project proposal. It may be possible to infer potential impact(s) for a new or modified project without the need for additional air quality analyses, as described in the following example.

In this example, an RMF is designed to work in conjunction with a regional scale photochemical model to evaluate potential impacts for criteria pollutant National Ambient Air Quality Standards (NAAQS) of concern (focused primarily upon a cumulative regional assessment of ozone and secondary particulate) and air quality related values (AQRV's). This RMF is most appropriate when specific numbers, size, and location of development are not well known for a proposed project, typically at the resource management plan (RMP), forest plan (FP), or leasing stage. These proposals often include large scale planning and leasing decisions that have potential to affect distant air quality values. However, a RMF can be adapted for additional models, approaches, and scale.

This RMF uses emissions sensitivities analyses to bracket potential impacts from future growth scenarios. If the emission projections for a stage of a new or modified project falls within the range of emissions growth used in prior sensitivity analyses, then existing modeling potentially satisfies analysis needs without having to perform additional air quality modeling.

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**Example Design:**

This RMF suggests that regional air quality assessments for both base year and future years be conducted at predetermined intervals. These intervals usually occur, at a minimum, every three (3) years corresponding to the cycle of the development by EPA’s national emission inventory (NEI). To maximize quality and representativeness, this RMF could leverage existing national, regional, and state/local emission databases. New base and future year modeling may be necessary prior to the next 3 year interval if regional development exceeds emissions growth projections for that planning period.

The regional air quality assessments may be conducted on a multistate basis to encompass nearby states to ensure complete airshed coverage. Grid resolution should adequately represent the geophysical characteristics of the domain and anticipated development.

For future year emissions, projections should be made from the base year to 10-15 years forward to examine the potential for maximum growth in the planning area. Emissions projections for non-oil and -gas emission sectors potentially can be leveraged from existing inventory databases. Examples may include: regional planning organizations (RPO’s), States, or EPA databases. For the oil and gas sector (O&G), emission growth estimates over the future year baseline should be estimated to characterize the potential range in growth. Future year growth estimates should examine the potential for low, medium, and high development based on the anticipated regional growth.

Emission sensitivities can be conducted using methods developed by the photochemical modeling community. The most straight forward method to address emission sensitivities uses photochemical modeling runs to examine incremental growth in the O&G sector. This approach is often referred to as the “brute force method” which examines the impact of emission growth through successive model runs showing impacts from alternative growth scenarios (e.g., High, Medium, and Low). Other probing techniques, which are more sophisticated, allow for the development of area specific source-receptor relationships. Examples include the Response Surface Methods (RSM), as developed from iterative model runs, and the Direct Decoupled Method (DDM), as developed within a particular photochemical model. RSM provides model sensitivity estimates across a wide range of emission changes, but is costly due to need for numerous iterations of the photochemical model. DDM allows for model sensitivity estimates for small emission changes (e.g., 10% - 20%) without having to rerun the model for each scenario, but is costly due to large upfront development.

**Table 1 - Reusable Data Products**

Category	BASE YEAR	FUTURE YEAR
Meteorology	Base Year (corresponds to 3-YR NEI baseline)	Base Year
Emissions Modeling	3-YR NEI	10 – 15 year projection
Basecase Analysis	Base Year Performance	NA
Emissions Sensitivity Analyses (Photochemical)	NA	O&G Growth Scenario (Low, Medium, and High)

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## EXAMPLE SCOPE OF WORK

**Task 1. Preparation of Work Plan**

A work plan shall be prepared that provides details of the modeling effort and approach.

**Task 2. Development of Comprehensive Modeling Protocol**

In this subtask, the Contractor will develop a modeling protocol which addresses the development of meteorological, emissions, and air quality modeling for this project. The Contractor will prepare a draft protocol for review by participating agencies. Upon receipt of comments, the Contractor will coordinate with the responsible organization to incorporate comments as warranted and submit a final modeling protocol to all study participants.

The modeling protocol will describe in detail how the air quality modeling inputs will be developed. The protocol shall address, at a minimum, the following:

1. Numerical meteorological model configuration including the following:
  - Horizontal and vertical model domain configuration
  - Physics options selection
  - Data sources for initial and boundary condition development
  - Four dimensional data assimilation (FDDA) strategy
2. Numerical meteorological performance evaluation methods
3. Emissions database development including:
  - Data sources for inventory development
  - Growth factor development
  - Oil and Gas Sector Development Scenarios
4. Base Year Air Quality Modeling Simulations
  - Processing of numerical meteorological fields
  - Initial and boundary condition development
  - Photolysis rate development
  - Photochemical model configuration and option selection
5. Base Year Air Quality Model Performance Evaluation
6. Emissions Sensitivity Scenarios for Future Oil and Gas Development Scenarios
  - Air quality model methods (“brute force” or model probing tools.)

The deliverables for this task will include a draft and final modeling protocol submitted to the responsible organization and participants.

**Task 3a. Annual Meteorological Modeling Simulation**

For this subtask, the Contractor will develop a numerical meteorological model fields necessary to support regional scale air quality modeling recommended under the MOU. Meteorological fields will be developed in accordance with details outlined in the protocol developed under Task 2 of this project.

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Deliverables under this subtask will include hourly numerical meteorological model fields for specified domains that can be used for development of meteorological inputs for photochemical modeling.

**Task 3b. Meteorological Model Performance Evaluation**

For this subtask, the Contractor will conduct a statistical performance evaluation of the numerical meteorological fields using methods and metrics described in Emery et al. (2001) and Tesche et al. (2002). The statistical performance evaluation will be conducted in accordance with details outlined in the protocol developed under Task 2 of this project.

The deliverable under this subtask will include a report documenting the evaluation of performance of the numerical weather model.

**Task 3c. Process Numerical Meteorological Fields for Input into Photochemical Model**

The purpose of this subtask is to provide meteorological inputs for the photochemical modeling platform and period(s) delineated in the protocol under Task 2 of this project. The Contractor will (1) process the numerical meteorological model data through the appropriate meteorological preprocessor for input into the photochemical, including subdomains identified in the protocol under Task 2; (2) quality assure (QA) meteorological inputs and results of vertical layer aggregation; and (3) document methods and QA results, and instructions for future processing of meteorological data.

The deliverables of this subtask are (1) the processed meteorological fields; (2) preprocessor run scripts; (3) the results of QA measures and log files from meteorological preprocessor; and (4) a report describing the approach and instructions for reproducing the preprocessing and analysis of meteorological fields for preparation as input to photochemical models.

**Task 4. Development of Emissions**

The purpose of this task is to create emissions inputs for use in the photochemical model identified under Task 2 of this project. Emissions will be developed for the modeling domain(s) determined under Task 2 for at least a 12-month consecutive period corresponding to the most current national emission inventory (NEI) baseline period.

For this task, the Contractor will (1) create speciation input files, emissions surrogate data, and landuse data appropriate for the photochemical model; (2) run SMOKE processors needed for photochemical platform specific emissions; (3) quality assure SMOKE outputs, correct and rerun as needed; and (4) document all processing steps, processing and data decisions, and provide an interim report on photochemical model emission inputs.

Emissions will be developed for the following:

1. Actual baseyear emissions (corresponding to most current NEI baseline year) for purposes of air quality model performance evaluation
2. "Typical" baseyear emissions for development of future year emissions projections

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3. Future year emissions
4. Future year emissions with Oil and Gas Sector emissions growth scenarios

**Task 5a. Base Year Air Quality Model Simulations**

The purpose of this subtask is to create a suitable baseyear modeling analysis that can serve as a platform to assess potential air quality impacts from future development scenarios. The Contractor will (1) use meteorological and emissions inputs created under Subtasks 3c and 4; (2) create initial and boundary condition (IC/BC) and photolysis rates data for input.

Deliverables for this subtask will include (1) all input data files (meteorology, emissions, IC/BC, photolysis); (2) all base base model output data files; and (3) model run scripts and log files created for completion of this task.

**Task 5b. Base Year Performance Evaluation**

The purpose of this subtask is to evaluate photochemical model performance for ozone and its precursor data (where available) and speciated fine particulate matter in order to achieve reasonable baseyear model performance for development of future year emissions. The Contractor will (1) acquire all observational data sets (IMPROVE, STN, CASTNET, and SLAMS/NAMS ozone) to conduct performance analysis; (2) conduct a phenomenological and statistical performance evaluation of base year simulations; and (3) document results of performance analysis.

Deliverables for this subtask include (1) an interim report documenting final model configuration, outstanding issues not resolved from subtask 5b; (2) further recommendations for baseyear model performance improvement; (3) model performance analyses and results; (4) final datasets and software used to conduct model performance evaluation; and (5) documentation on how to perform analyses.

**Task 6. Future Year Emissions Sensitivity Scenarios**

The purpose of this task is to complete emissions sensitivity analyses for future development scenarios for the oil and gas sector consistent with the goals of MOU to provide a basis for describing future development projects within the airshed. Emissions sensitivity analyses will use model techniques and probing tools described in the protocol developed under task 2 of this project. The Contractor will (1) develop model ready emissions inputs from the future year inventory developed under Task 4 of this project; (2) develop model emission ready emission based upon projections for oil and gas growth scenarios to conduct sensitivities of future oil and gas development; (3) conduct air quality simulations for oil and gas emissions sensitivities using methods described in the protocol developed under Task 2 of the project; and (4) develop final documentation suitable for use as a technical support document for future resource development plans with emissions projections consistent with the emission ranges assumed for future year development scenarios.

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Deliverables for this task include (1) a final report documenting future year emissions sensitivities; (2) documentation of methods for all model inputs and run scripts; and (3) all model output from emissions sensitivity scenarios.

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# **OGS Appendix B. Public Comments**

**The following pages contain public comments  
on the draft supplement and Forest Service  
responses.**

## **Air Quality**

### **Comment 1**

Future gas development in the Santa Fe National Forest should employ control technologies that reduce emissions of air pollutants.

**Comment submitted by:** New Mexico Environment Department Air Quality Bureau – Surface Water Quality Bureau (NMED – AQB-SWQB)

### **Response to Comment 1**

The Forest will require future gas developments to employ control technologies that reduce air pollutants. As noted in the January 7, 2009, Appeal No. 09-03-00-0001-A217 Review Decision for Issue 2, Contention F, “[t]he FEIS appropriately defers discussion of specific mitigation measures to the second-level site-specific NEPA analysis.”

### **Comment 2**

To further ensure air quality standards are met, applicable local or county regulations requiring noise and/or dust control must be followed. If none are in effect, controlling construction-related air quality impacts during projects should be considered to reduce the impact of fugitive dust and/or noise on community members.

**Comment submitted by:** NMED – AQB-SWQB

### **Response to Comment 2**

Forest Service regulations and leases require that all applicable State and county regulations must be complied with.

### **Comment 3**

Dust control measures should be taken to minimize the release of particulates due to vehicular traffic and construction.

**Comment submitted by:** NMED – AQB-SWQB

### **Response to Comment 3**

The Forest agrees. See response to Comment 1.

### **Comment 4**

All asphalt, concrete, quarrying, crushing, and screening facilities contracted in conjunction with the proposed project must have current and proper air quality permits.

**Comment submitted by:** NMED – AQB-SWQB

### **Response to Comment 4**

See response to Comment 2.

### **Comment 5**

The Final Supplemental EIS should explain that a draft memorandum of understanding (MOU) is now in preparation among the Department of the Interior, on behalf of the Bureau of Land Management (BLM), National Park Service (NPS), EPA, and Department of Agriculture addressing this concern. This MOU sets forth expectations and agreements among the participating agencies for addressing air quality impact analysis and mitigation through the NEPA process for all Federal decisions relating to oil and gas planning, leasing, or field development. Once the MOU is signed, EPA asks that it be incorporated in the FSFEIS and assurances be given that air quality will be a major factor in the decision process for this region.

**Comment submitted by:** EPA Region 6

### **Response to Comment 5**

The MOU signed on June 23, 2011, is included in the FSEIS as OGS Appendix A.

In accordance with Part X.C.3. of the MOU, the Forest determined the NEPA analysis was ongoing when the MOU was finalized, and the EIS could not be completed in a cost-effective or timely matter if the MOU were to be followed. However, the Forest did identify the reasonably foreseeable number of wells (page 19 of FSEIS) and prepared the emissions inventory (table OGS 10) as called for in the MOU V.E. 1 and 2. Due to the small number of reasonably foreseeable wells, it was determined modeling would be ineffective because the results would fall within the range of uncertainty of the models.

Air quality analysis and mitigation will be developed in accordance with the MOU during the NEPA analysis for oil and gas developments proposed in the future as described in the FSEIS on pages 26 and 27.

### **Comment 6**

The SDEIS and FEIS fail to adequately analyze and assess the direct, indirect, and cumulative air quality impacts of additional oil and gas leasing in accordance with 40 CFR §1502.16 and other CEQ NEPA regulations. Specifically, the SDEIS and FEIS fail to adequately analyze and assess impacts in regard to haze, or visibility, impacts to Class I areas, with regards to Prevention of Significant Deterioration (“PSD”) increment impacts, and with regards to ozone and nitrogen dioxide impacts.

**Comment submitted by:** WildEarth Guardians

### **Response to Comment 6**

As noted in the January 7, 2009, Appeal No. 09-03-00-0001-A217 Review Decision for Issue 2, Contention D “PSD increment analysis is not a requirement for the project. The decision does not result in violation of Federal, state or local regulations, the Santa Fe National Forest Plan, or NFMA.”

Air quality analysis and assessments are described in the final supplement pages 4 through 27.

## **Comment 7**

In particular, it is not apparent that the Forest Service will ensure compliance with the following standards and guidelines:

- **F04:** Management activities will be planned so that air quality will meet applicable Federal, State, and local regulations; and
- **Watershed & Air F01:** In the Class I Air Quality Areas (Pecos Wilderness except 1980 additions and San Pedro Parks) maintain high quality visual conditions...Impacts of air pollution generating activities will be predicted using current modeling techniques.

We are concerned that the Forest Service has not demonstrated that these standards and guidelines will be complied with. In particular, it is not apparent that air pollution impacts of oil and gas development in Class I Air Quality Areas has been predicted using current modeling techniques.

**Comment submitted by:** WildEarth Guardians

## **Response to Comment 7**

The analysis described on page 23 of the FSEIS concluded the 20 wells projected would cause a small increase in pollutants, but would not cause the levels to exceed State and Federal air quality standards; nor would they cause measurable visibility degradation in nearby Class I areas.

In addition, it was determined that it would be inappropriate to directly model the impacts to air quality from 20 wells due to the cost in both time and money using current modeling techniques; and that such results would fall within the range of uncertainty, due to the small number of potential wells. However, the most current modeling in the basin was considered as well as analyses from the Jicarilla EIS and the Draft Supplemental EIS San Juan Plan Revision.

## **Soils**

### **Comment 8**

Areas disturbed by construction activities, within and adjacent to the project area should be reclaimed to avoid long-term problems with erosion and fugitive dust.

**Comment submitted by:** NMED – AQB-SWQB

### **Response to Comment 8**

The Forest will require future development activities to reclaim project areas to avoid erosion and fugitive dust problems. As noted in the January 7, 2009, Appeal No. 09-03-00-0001-A217 Review Decision for Issue 2, Contention F, “[t]he FEIS appropriately defers discussion of specific mitigation measures to the second-level site-specific NEPA analysis.”

## **T&E Species**

### **Comment 9**

The Draft Supplement to the Final EIS (FSFEIS) assesses the potential impact to the Mexican spotted owl (MSO) which is listed and has critical habitat occurring in Rio Arriba County. Although the Forest Service has made its determination that the oil and gas development will

have no direct, indirect, or cumulative impact i.e., “no effect” to the MSO, EPA believes that the coordination letters from the U.S. Fish and Wildlife Service (USFWS) should be in the final supplement and referenced in the impact discussion. The USFWS’s coordination letters and biological opinion are required to verify proper Section 7 Consultation and to validate the “no effect” determination. Please incorporate the endangered species coordination correspondence in the FSFEIS.

**Comment submitted by:** EPA Region 6

**Response to Comment 9**

The findings of the biological assessment are found on page 33 of the final supplement pages. The biological assessment and evaluation is part of the project record (PR Document 247).

**Comment 10**

Furthermore, the SDEIS and FEIS simply do not demonstrate that authorizing ramped up oil and gas leasing on the Santa Fe National Forest would comply with Section 7 of the Endangered Species Act, 16 USC § 1536.

**Comment submitted by:** WildEarth Guardians

**Response to Comment 10**

As specified in the FSEIS on page 33, conditions of approval and mitigations to protect threatened and endangered species will be developed in consultation with the U.S. Fish and Wildlife Service during the site-specific NEPA analysis of the application for permit to drill (APD) before ground-disturbing activities occur.

This comment appears to be premised upon two fallacies—the first is that the FSEIS is authorizing oil and gas leasing. That is incorrect, this EIS is analyzing what stipulations are appropriate to include in the Forest Plan amendment as stated on page 19 of the FEIS. Additional NEPA analysis will be done prior to leasing any land, and detailed NEPA analysis will be done if a lease is issued and a proposal to develop the lease is submitted.

The second fallacy is the FSEIS “ramps up” leasing, presumably meaning increases the area available for leasing and/or decreases the amount of protection given an area. None of the alternatives described in the FEIS or the SFEIS increase the acreage available for oil and gas leasing. The preferred alternative imposes new restrictions on a substantial part of the area analyzed.

	Existing Plan	Proposed Action
No Surface Occupancy	0 Acres	30,400 Acres
Controlled Surface Use	16,500 Acres	29,100 Acres

## **Forest Planning**

### **Comment 11**

In sum, the Forest Service cannot defer any site-specific analysis of the potentially significant environmental impacts of oil and gas development or defer requiring mitigation measures that would adequately protect natural resources and ensure compliance with relevant laws and regulations. The SDEIS and FEIS must fully analyze and assess the reasonably foreseeable impacts of oil and gas development and cannot defer the analysis.

**Comment submitted by:** WildEarth Guardians

### **Response to Comment 11**

As noted in the January 7, 2009, Appeal No. 09-03-00-0001-A217 Review Decision Findings for Issue 1, “[m]itigation (stipulations) were developed which were appropriate to the leasing stage of analysis and decisionmaking. The ROD appropriately defers site-specific NEPA analysis with development of site-specific mitigation and monitoring requirements to the time when a site-specific APD is received.”

### **Comment 12**

The Forest Service is required to ensure its actions are consistent with the 1987 “Carson National Forest Land and Resource Management Plan” (LRMP), as amended. See USC § 1604(i). Unfortunately, the Forest Service failed to do so with regards to protecting air quality.

**Comment submitted by:** WildEarth Guardians

### **Response to Comment 12**

The analysis area is within the Santa Fe National Forest, so the 1987 “Carson National Forest Land and Resource Management Plan,” as amended, is not the governing document.

### **Comment 13**

Furthermore, as already explained, the issuance of oil and gas leases is an irreversible commitment of resources that requires a detailed analysis of impacts. The Forest Service cannot defer consultation under the ESA at the leasing stage.

**Comment submitted by:** WildEarth Guardians

### **Response to Comment 13**

The FEIS and SFEIS analyze land classification for a Forest Plan amendment, and does not authorize issuing specific leases. Prior to authorizing a lease, additional NEPA documentation will be done as stated in the FEIS on pages 1 and 6. The resource is committed only after leasing.

Also, see response to Comment 11.

## Alternatives

### Comment 14

NEPA requires agencies to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” 42 U.S.C. § 4332(2)(E). To achieve these ends, an EIS must “[r]igorously explore and objectively evaluate *all* reasonable alternatives.” 40 C.F.R. § 1502.14; *Utahns for Better Transp.*, 305 F.3d at 1166 (emphasis added). This alternatives analysis is “the heart of the [EIS].” 40 CFR § 1502.14. Unfortunately, in the case of the SDEIS and FEIS, the Forest Service appears to have failed to analyze and consider in detail a range of reasonable leasing alternatives in accordance with 40 CFR § 1502.14. Of particular concern is that every action alternative considered by the Forest Service is virtually similar in amount of oil and gas leasing allowed and in the environmental impacts... Clearly a number of alternatives exist to address the air quality impacts of oil and gas development on the Santa Fe National Forest. We request the Forest Service analyze in detail such alternatives to ensure full protection of air quality.

**Comment submitted by:** WildEarth Guardians

### Response to Comment 14

As discussed in the FEIS pages 23 through 41, three alternatives (including the No Action) were analyzed in detail and six additional alternatives were considered, but eliminated from detailed study. As stated in the January 7, 2009, Appeal No. 09-03-00-0001-A217 Review Decision Findings for Issue 1, “[m]itigation (stipulations) were developed which were appropriate to the leasing stage of analysis and decisionmaking. The ROD appropriately defers site-specific NEPA analysis with development of site-specific mitigation and monitoring requirements to the time when a site-specific APD is received.” As described on pages 26 and 27 of the SFEIS, mitigation measures for air quality will be developed during the site-specific NEPA analysis.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS, TX 75202-2733

*DNB*

NOV 04 2010

*JW* JON (11/10/2010)  
— MIKE (cc:)  
— JENNIFER

Daniel J. Jiron  
Forest Supervisor  
Santa Fe National Forest  
11 Forest Lane  
Santa Fe, NM 87508

Dear Mr. Jiron:

In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality Regulations (CEQ) for Implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Draft Supplement to the Final Environmental Impact Statement (DSFEIS) for Oil-Gas Leasing in the Santa Fe National Forest, New Mexico. The DSFEIS is specific to oil and gas leasing and impact assessment relating to new information provided by the Biological Opinion issued by the U.S Fish and Wildlife Service issued on June 10, 2005 (Consultation No. 2-22-03-F-366), and recent air quality monitoring data provided by the new Navajo Lake ambient air monitoring station.

EPA rates the DSFEIS as "EC 2," i.e., EPA has "Environmental Concerns to the Implementation of the Proposed Leasing Action and Requests Additional Information." EPA's concerns are specific to endangered species coordination and potential future air quality impacts. Our enclosed detail comments are offered to explain our concerns and to insure full compliance with the requirements of NEPA and the Council on Environmental Quality (CEQ) regulations. EPA asks that these comments be addressed and responded to in the Final Supplement to the Final EIS (FSFEIS).

Our classification will be published on the EPA web site, [www.epa.gov](http://www.epa.gov), according to our responsibility under Section 309 of the Clean Air Act to inform the public of our views on proposed Federal actions. If you have any questions, please contact Mike Jansky of my staff at (214) 665-7451 or by e-mail at [jansky.michael@epa.gov](mailto:jansky.michael@epa.gov) for assistance.

EPA appreciates the opportunity to review the DSFEIS. Please send our office five copies of the FSFEIS when it is sent to the Office of Federal Activities, EPA (Mail Code 2252A), Ariel Rios Federal Building, 1200 Pennsylvania Ave, N.W., Washington, D.C. 20004.

Sincerely yours,

Rhonda M. Smith, Chief  
Office of Planning and  
Coordination 6ENXP

Enclosure

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**DETAILED COMMENTS  
ON  
DRAFT SUPPLEMENT TO THE  
FINAL ENVIRONMENTAL IMPACT STATEMENT  
FOR THE  
SANTA FE NATIONAL FOREST OIL AND GAS LEASING**

Endangered Species Act

The Draft Supplement to the Final EIS (FSFEIS) assesses the potential impact to the Mexican Spotted Owl (MSO) which is listed and has critical habitat occurring in Rio Arriba County. Although the Forest Service has made its determination that the oil and gas development will have no direct, indirect or cumulative impact i.e., "no effect" to the MSO, EPA believes that the coordination letters from the US Fish and Wildlife Service (USFWS) should be in the Final Supplement and referenced in the impact discussion. The USFWS's coordination letters and biological opinion are required to verify proper Section 7 Consultation and to validate the "no effect" determination. Please incorporate the endangered species coordination correspondence in the FSFEIS.

Clean Air Act

According to the DSFEIS, the project region attains all National and New Mexico ambient air quality standards. However, the DSFEIS indicates that there is concern since the Navajo Lake Air Monitor, located approximately 50 miles northwest of the project area, recently monitored pollutant levels that come close to the NAAQS for ozone. As a result of this finding, EPA is concerned for the potential impact this leasing action may have on future air quality for this area. The Final Supplemental EIS should explain that a Draft Memorandum of Understanding (MOU) is now in preparation among the Department of the Interior, on behalf of Bureau of Land Management (BLM), National Park Service (NPS), EPA, and the Department of Agriculture addressing this concern. This MOU sets forth expectations and agreements among the participating agencies for addressing air quality impact analyses and mitigation through the NEPA process for all Federal decisions relating to oil and gas planning, leasing, or field development. Once the MOU is signed, EPA asks that it be incorporated in the FSFEIS and assurances be given that air quality will be a major factor in the decision process for this region.

**NEW MEXICO**  
**ENVIRONMENT DEPARTMENT**  
*Office of the Secretary*

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BILL RICHARDSON  
Governor

RON CURRY  
Secretary  
Sarah Cottrell  
Deputy Secretary

October 14, 2010

Erin Connelly  
Acting Forest Supervisor  
Santa Fe National Forest  
11 Forest Lane  
Santa Fe, NM 87508

**RE: Proposed Santa Fe National Forest Oil -Gas Leasing Project**

Dear Ms. Connelly:

A response to your letter regarding the above named project was sent to you on October 8, 2010. In the interim another comment was received from the Air Quality Bureau. I am sending this revised comment letter to you incorporating the Air Quality Bureau's comments with the Surface Water Quality Bureau comments provided to you previously.

**Air Quality Bureau**

The New Mexico Environment Department Air Quality Bureau has evaluated the information submitted with respect to the Santa Fe Oil and Gas Leasing Project in the Santa Fe National Forest. The Santa Fe National Forest encompasses several counties in the State to include Sandoval and Rio Arriba Counties. These counties are all currently considered to be in attainment with all New Mexico and National Ambient Air Quality Standards, however, Rio Arriba and Sandoval Counties are adjacent to San Juan County which in the event that there are revisions to the current NAAQS for ozone, San Juan County may become nonattainment for the new ozone standards. Emission sources in adjacent counties, Sandoval and Rio Arriba, can disperse and contribute to cumulative impacts in San Juan County.

Cumulative effects of new oil and gas wells in the Santa Fe Nation Forest, especially those near and adjacent to areas that have impaired air quality and Class I areas, increase future background levels of pollutants in the area. Future gas development in the Santa Fe National Forest should employ control technologies that reduce emissions of air pollutants.

To further ensure air quality standards are met, applicable local or county regulations requiring noise and/or dust control must be followed; if none are in effect, controlling construction-related air quality impacts during projects should be considered to reduce the impact of fugitive dust and/or noise on community members.

Potential exists for temporary increases in dust and emissions from earthmoving, construction equipment, and other vehicles, however the increases should not result in non-attainment of air quality standards. Dust control measures should be taken to minimize the release of particulates due to vehicular traffic and construction. Areas disturbed by the construction activities, within and adjacent to the project area should be reclaimed to avoid long-term problems with erosion and fugitive dust

All asphalt, concrete, quarrying, crushing and screening facilities contracted in conjunction with the proposed project must have current and proper air quality permits. For more information on air quality permitting and modeling requirements, please refer to 20.2.72 NMAC. The project as proposed should not be anticipated to contribute negatively to air quality on a long-term basis.

If air quality permits are required for the proposed action, permits will need to be administered by the New Mexico Environment Department (NMED).

The NMED administers a voluntary emission reduction program known as San-Juan Voluntary Innovative Strategies for Today's Air Standards (VISTAS). The purpose of San Juan VISTAS is to identify, promote, and implement cost-effective technologies and Best Management Practices to reduce ozone precursor emissions (oxides of nitrogen and volatile organic compounds) in northwestern New Mexico. San Juan VISTAS is now open to companies in the oil and gas exploration and production industries in San Juan, Rio Arriba, and Sandoval Counties. Companies that participate in the program are recognized by NMED. For more information about the VISTAS program, go to <http://www.nmenv.state.nm.us/aqb/projects/SJV/index.html>.

#### **Surface Water Quality Bureau**

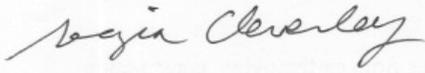
Overall, potential impacts on environmental resources are anticipated to be minimal under the proposed guidelines. The Santa Fe National Forest has prepared a "Draft Supplement to the Final Environmental Impact Statement for Oil-Gas Leasing" on the Santa Fe National Forest. The supplement evaluates the effects of the Oil-Gas Leasing Proposed Action on listed, proposed, and candidate species, and designated and proposed critical habitats, to determine consistency with the "Region wide Programmatic Land and Resource Management Plan Biological Opinion" issued by the U.S. Fish and Wildlife Service on June 10, 2005.

The Oil-Gas Leasing Proposed Action would amend the Forest Plan oil and gas leasing availability with specific stipulations where needed to protect wildlife and surface resources within the San Juan Basin on the Santa Fe National Forest.

There appear to be no other public concerns at this time.

I hope this information is helpful to you.

Sincerely,



Georgia Cleverley  
Environmental Impact Review Coordinator  
NMED File #33309 revised



BILL RICHARDSON  
Governor

NEW MEXICO  
ENVIRONMENT DEPARTMENT

*Office of the Secretary*

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RON CURRY  
Secretary  
Sarah Cottrell  
Deputy Secretary

October 8, 2010

Erin Connelly  
Acting Forest Supervisor  
Santa Fe National Forest  
11 Forest Lane  
Santa Fe, NM 87508

**RE: Proposed Santa Fe National Forest Oil -Gas Leasing Project**

Dear Ms. Connelly:

Your letter regarding the above named project was received in the New Mexico Environment Department (NMED) and was sent to various Bureaus for review and comment. Comments were provided by the Surface Water Quality Bureau and are as follows.

**Surface Water Quality Bureau**

Overall, potential impacts on environmental resources are anticipated to be minimal under the proposed guidelines. The Santa Fe National Forest has prepared a "Draft Supplement to the Final Environmental Impact Statement for Oil-Gas Leasing" on the Santa Fe National Forest. The supplement evaluates the effects of the Oil-Gas Leasing Proposed Action on listed, proposed, and candidate species, and designated and proposed critical habitats, to determine consistency with the "Region wide Programmatic Land and Resource Management Plan Biological Opinion" issued by the U.S. Fish and Wildlife Service on June 10, 2005.

The Oil-Gas Leasing Proposed Action would amend the Forest Plan oil and gas leasing availability with specific stipulations where needed to protect wildlife and surface resources within the San Juan Basin on the Santa Fe National Forest.

There appear to be no other public concerns at this time.

I hope this information is helpful to you.

Sincerely,



Georgia Cleverley  
Environmental Impact Review Coordinator  
NMED File #3309



United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
1001 Indian School NW, Suite 348  
Albuquerque, New Mexico 87104



ER 10/817  
File 9043.1

November 3, 2010

Oil and Gas Supplement Comments  
Santa Fe National Forest  
11 Forest Lane  
Santa Fe, New Mexico 87508

Subject: Draft Supplement to the Final Environmental Impact Statement (DSFEIS) for Oil and Gas Leasing, Updated and New Information, Implementation on the Santa Fe National Forest, San Juan Basin, Cuba Ranger District, Rio Arriba, Los Alamos, Santa Fe, San Miguel, Mora and Taos Counties, Santa Fe, New Mexico

Dear Sir/Madame:

The U.S. Department of the Interior has reviewed the subject DSFEIS. In this regard, we have no comment.

Thank you for the opportunity to review this document.

Sincerely,

A handwritten signature in cursive script that reads "Stephen R. Spencer".

Stephen R. Spencer  
Regional Environmental Officer



November 8, 2010

**BY ELECTRONIC MAIL AND  
CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

Acting Forest Supervisor Erin Connelly  
U.S. Forest Service  
Santa Fe National Forest  
11 Forest Lane  
Santa Fe, NM 87508  
[Comments-southwestern-santafe@fs.fed.us](mailto:Comments-southwestern-santafe@fs.fed.us)

**Re: Supplemental Draft Environmental Impact Statement for Oil and Gas  
Leasing on the Santa Fe National Forest**

Dear Acting Supervisor Connelly:

WildEarth Guardians submits the following comments on the Forest Service's Supplemental Draft Environmental Impact Statement ("SDEIS") regarding oil and gas leasing on the Santa Fe National Forest. The SDEIS revises portions of the original Final Environmental Impact Statement ("FEIS") prepared for oil and gas leasing on the Santa Fe National Forest in response to an appeal remand from the Region 3 Regional Forester's office.

**1. The SDEIS, FEIS, and Proposed Action Appear Contrary to NEPA in that Site-specific Analyses of Impacts are Being Inappropriately Deferred**

The SDEIS indicates that the Forest Service's original proposal, as outlined in the FEIS, remains the same. That proposal would authorize actions that pose potentially significant environmental impacts. Indeed, the Forest Service is proposing to set forth stipulations that must be adhered to if the Bureau of Land Management ("BLM") issues further leases on the Santa Fe National Forest. The leasing of oil and gas resources confers a right to develop a lease. See 43 CFR § 3101.1-2. Consequently, the proposal is an explicit approval of the right of oil and gas leases to be developed within the Santa Fe National Forest and an explicit approval of the attendant environmental impacts.

Therefore, contrary to assertion's that have been made by the Forest Service, the SDEIS and proposed action represents a proposal to authorize a site-specific commitment of resources. Indeed, the FEIS clearly explains:

1536 Wynkoop Street, Ste. 301      Denver, CO 80202      303-573-4898      [www.wildearthguardians.org](http://www.wildearthguardians.org)  
SANTA FE      DENVER      PHOENIX

When the Forest Service authorizes the BLM to proceed with issuing an oil-gas lease on National Forest System lands, it is considered a Federal action subject to NEPA, since it involves a commitment of resources in which the lease grants access rights to the subsurface resource within the lease area.

FEIS at 14. Thus, in authorizing the BLM to proceed with oil and gas leasing on the Santa Fe National Forest, the Forest Service will have conceded discretion to limit or otherwise mitigate the right to develop oil and gas leases. Put simply, the Forest Supervisor will make an irreversible commitment of resources if a decision is made to authorize the proposed oil and gas leasing.

Authorizing lands to be leased for oil and gas development is, by itself, a significant action that requires in-depth and site-specific analysis, as required by the National Environmental Policy Act ("NEPA"). It is at the time of leasing, or in this case approval of future leasing, not with the issuance of an Application for Permit to Drill ("APD"), that federal agencies must analyze potential impacts from oil and gas development.

The requirement that an agency undertake appropriate environmental analysis prior to the issuance of mineral leases was addressed comprehensively in *Sierra Club v. Peterson*, 717 F.2d 1409 (D.C. Cir. 1983), which dealt with a similar Forest Service decision. There, the Sierra Club challenged the decision of the Forest Service and the BLM to issue oil and gas leases on lands within the Targhee and Bridger-Teton national forests of Idaho and Wyoming, without requiring preparation of an EIS. The Forest Service had conducted a programmatic NEPA analysis, then recommended granting lease applications with stipulations based upon broad characterizations as to whether the land was considered environmentally sensitive. Because the Forest Service determined that issuance of the leases with the recommended stipulations would not result in significant adverse impacts to the environment, the agency decided that, with respect to the entire area, no EIS was required at the leasing stage. *Id.* at 1410. The D.C. Circuit rejected the Service's approach as failing to comply with NEPA. The Court held:

Even assuming, *arguendo*, that all lease stipulations are fully enforceable, once the land is leased the Department no longer has the authority to preclude surface disturbing activities even if the environmental impact of such activity is significant. The Department can only impose "mitigation" measures upon a lessee . . . Thus, with respect to the [leases where surface occupancy is not precluded] the decision to allow surface disturbing activities has been made at the leasing stage and, under NEPA, this is the point at which the environmental impacts of such activities must be evaluated.

*Id.*, at 1414. The court explained that the appropriate time for preparing an EIS to analyze and assess potentially significant impacts of oil and gas development is prior to a decision, "when the decision-maker retains a maximum range of options;" that is, before the agency makes "'irreversible and irretrievable commitments of resources' to an action which will affect the environment..." *Id.*, citing *Mobil Oil Corp. v. F.T.C.*, 562 F.2d 170, 173 (2nd Cir. 1977).

The D.C. Circuit specifically rejected the argument that the act of leasing was a mere paper transaction requiring no site-specific analysis of environmental impacts. Rather, it

concluded that where the agency could not completely preclude all surface disturbances through the issuance of non-surface occupancy (“NSO”) leases, the “critical time” before which full NEPA analysis must occur is prior to “the point of leasing” *Id.* at 1414.

The goal of a NEPA analysis is to ensure that agency decisionmakers identify, evaluate, and take into account the environmental costs and benefits of all reasonable approaches to a particular proposal prior to choosing a course of action, and in this way to foster better decisionmaking. To that end, federal courts have repeatedly affirmed that NEPA is forward-looking, and that it applies prospectively to ensure that decisions are not made until decisionmakers and the public have had a chance to evaluate a proposal's likely site-specific effects. *See e.g. Robertson v. Methow Valley Citizens*, 109 S.Ct. 1835, 1845 (1989) (NEPA's goals achieved during period when agency is “contemplating a major action,” rather than “after the resources have been committed or the die otherwise cast.”); *Commonwealth of Massachusetts v. Watt*, 716 F.2d 946, 952-53 (1st Cir. 1983) (“Once large bureaucracies are committed to a course of action, it is difficult to change that course -- even if new, or more thorough, NEPA statements are prepared and the agency is told to ‘re-decide.’”) (enjoining agency action for procedural NEPA violation); *Sierra Club v. Peterson*, 717 F.2d 1409, 1414 (D.C. Cir. 1983) (appropriate time for NEPA compliance is “prior to a decision, when the decisionmaker retains a maximum range of options.” *Environmental Defense Fund v. Andrus*, 596 F.2d 848, 852-53 (9th Cir. 1979).

Unless the Forest Service mandates a complete “no surface occupancy” stipulation on the Santa Fe National Forest or sufficient mitigations in authorizing lands to be leased by the BLM, NEPA documentation must include a full discussion of alternatives and potential impacts, as well as set forth mitigation measures and monitoring requirements. The Ninth Circuit reiterated this position in *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1227 (9th Cir. 1988), stating that: “It is clear from our decision in *Conner* that sale of the Deep Creek leases required preparation of an EIS unless the lease ‘absolutely prohibits surface disturbance in the absence of specific government approval.’”

The Interior Board of Land Appeals (“IBLA”) has followed the approach of the *Sierra Club* line of cases. In *Union Oil Co. of California*, 102 IBLA 187 (1988), the IBLA stated:

Peterson makes clear that the validity of BLM’s decision not to prepare an EIS prior to issuing mineral leases depends upon whether there has been an “irreversible, irretrievable commitment of resources.” ***If the BLM or Forest Service has not retained the authority to preclude all surface disturbance activity, then the decision to lease is itself the point of “irreversible, irretrievable commitment of resources” mandating the preparation of an EIS.***

*Id.* at 189. *See also Sierra Club, The Mono Lake Committee*, 79 IBLA 240, 248 (1984) (“precluding surface disturbing activities would allow deferral of environmental review, but ... only reserving the authority to impose reasonable mitigation measures would not”); *Union Oil Co. of California*, 99 IBLA 95 (1987) (holding that later analysis serves no purpose if by time an EIS is finally prepared, some options are no longer available); *Sierra Club, the Mono Lake*

*Committee*, 84 IBLA 175 (1984) (same); *Sierra Club, Oregon Chapter*, 87 IBLA 1 (1985) (same).

The recent 10<sup>th</sup> Circuit Court of Appeals decision in *New Mexico v. BLM* reiterates and clearly reaffirms that the BLM must conduct a sufficiently site-specific NEPA analysis before leasing, holding not only must the BLM analyze and assess environmental impacts, but must also consider a range of alternatives. The Court held that a site-specific analysis of impacts of oil and gas leasing where such impacts are “reasonably foreseeable.” *N.M. ex rel. Richardson v. BLM*, 565, F.3d 683, 718-719 (10<sup>th</sup> Cir. 2009). Similar to that case, the Forest Service here cannot authorize oil and gas leasing on the Santa Fe National Forest without preparing a site-specific environmental analysis and setting forth mitigation measures and monitoring requirements.

Although the Forest Service may claim that mitigation measures will be developed at the APD stage, as explained, this approach to mitigating the potentially significant impacts of oil and gas leasing is fundamentally flawed. This is due to the fact that once the Forest Service authorizes oil and gas leasing rights to be conferred, the agency limits its discretion to mitigate the potentially significant impacts of oil and gas drilling. By committing to consent to the rights of oil and gas leasing, the Forest Service has committed an irretrievable and irreversible commitment of resources. Any subsequently prepared environmental analysis and decision would be limited only by the stipulations set forth in any decision based on the current SDEIS and FEIS. To the extent mitigation measures could be developed upon issuance of an APD, these mitigations measures would be constrained so as to not interfere with the rights of an oil and gas leaseholder.

In sum, the Forest Service cannot defer any site-specific analysis of the potentially significant environmental impacts of oil and gas development or defer requiring mitigation measures that would adequately protect natural resources and ensure compliance with relevant laws and regulations. The SDEIS and FEIS must fully analyze and assess the reasonably foreseeable impacts of oil and gas development and cannot defer the analysis.

**2. The SDEIS and FEIS Appear to Fail to Adequately Analyze, Assess, and Mitigate the Direct, Indirect, and Cumulative Air Quality Impacts of Leasing and the Foreseeable Impacts of Oil and Gas Development**

The SDEIS and FEIS fail to adequately analyze and assess the direct, indirect, and cumulative air quality impacts of additional oil and gas leasing in accordance with 40 CFR § 1502.16 and other CEQ NEPA regulations. Specifically, the SDEIS and FEIS fails to adequately analyze and assess impacts in regards to haze, or visibility, impacts to Class I areas, with regards to Prevention of Significant Deterioration (“PSD”) increment impacts, and with regards to ozone and nitrogen dioxide impacts.

- **Haze/Visibility**

The Forest Service asserts in the SDEIS that air quality mitigation measures would protect visibility in nearby Class I areas such as the San Pedro Parks Wilderness, and that oil and gas development would not adversely affect visibility. The Forest Service actually asserts that

there is no “significant deterioration in visibility [that] has occurred to date.” SDEIS at 12. These assertions are unsupported.

For one thing, neither the SDEIS or FEIS points to no specific mitigation measure that would limit visibility-impairing pollution. Although the Forest Service asserts that oil and gas development would comply with rules under the New Mexico Environment Department’s (“NMED’s”) Administrative Code, many, if not all, sources of air pollution associated with oil and gas development either fall under regulatory thresholds established in NMED air quality regulations or are virtually unregulated.

For example, NMED air quality regulations only require that a source of air pollution obtain a construction permit if a source emits more than 25 tons/year or 10 pounds/hour of any criteria air pollutant. *See* NMAC 20.2.72. However, while the SDEIS notes that a number of sources related to oil and gas development will release air pollution, including dehydrators, well testing and completions, engines (including drill rig engines and compressor engines), and separators (*see* SDEIS at 15), many, if not all, of these sources do not emit more than 25 tons/year or 10 pounds per hour of any criteria air pollutant. Furthermore, there are no NMED air quality regulations in the NMAC that explicitly limit emissions from sources of air pollution related to oil and gas development. Thus, even if sources, such as compressor engines and drill rig engines, would be required to obtain construction permits, these sources would not be required to limit emissions in any way.

Although the Forest Service may assert that the BLM and NMED will limit haze-forming nitrogen oxide (“NOx”) pollution from compressor engines, NMED has not adopted any rules that explicitly limit NOx emissions from compressor engines and the BLM does not enforce NOx emission limits imposed on any oil and gas operators. In fact, the BLM defers to NMED, which lacks any regulatory authority whatsoever to mandate and enforce NOx emission limits for compressor engines.

Finally, the Forest Service’s assertion that visibility degradation has not occurred in the San Pedro Parks Wilderness is contradicted by NMED’s own analyses. According to the agency’s recently proposed Regional Haze State Implementation Plan, visibility in the San Pedro Parks Wilderness area is not only impaired, but it’s projected to remain virtually unchanged by 2018. *See* NMED, Proposed Regional Haze State Implementation Plan, *available at* [http://www.nmenv.state.nm.us/aqb/reghaz/documents/Proposed\\_RH\\_SIP\\_308\\_06212010.pdf](http://www.nmenv.state.nm.us/aqb/reghaz/documents/Proposed_RH_SIP_308_06212010.pdf). It is unclear how the Forest Service can claim that visibility will be protected when it is clear that any additional oil and gas development on the Santa Fe National Forest will only fuel visibility impairment in the San Pedro Parks Wilderness Area.

- **Ozone**

Ozone forms when two pollutants—NOx and volatile organic compounds (“VOCs”) react with sunlight. Federal standards, or national ambient air quality standards (“NAAQS”), currently limit ozone concentrations to no more than 0.075 parts per million (“ppm”) over an eight-hour period. *See* 40 CFR 50.10. However, the U.S. Environmental Protection Agency (“EPA”) has proposed to strengthen the ozone NAAQS to a level between 0.060 and 0.07 ppm.

*See* 75 Fed. Reg. Fed. Reg. 2938-3052 (Jan. 19, 2010). These standards are likely to be finalized by the end of the year.

We are concerned that the SDEIS does not adequately analyze and assess ozone impacts. Of particular concern is that the SDEIS claims that the Four Corners ozone modeling report indicates that compliance with the current NAAQS will be maintained by 2018, even if the status quo is maintained. This is not the case. The report indicates that if emission mitigation scenarios are not pursued, that exceedances and/or violations of the NAAQS are likely in the Four Corners region. Given that the emission mitigation scenarios outlined in the modeling report have not been adopted, the report seems to indicate that, on a cumulative basis, the proposed action will contribute to violations and/or exceedances of the ozone NAAQS.

We are also concerned that the Forest Service's estimates of VOC and NOx emissions associated with any oil and gas development on the Santa Fe National Forest are not accurate. The Forest Service undertook a very crude "proration" analysis that essentially took the overall level of VOC and NOx emissions projected by the Carson National Forest with regards to its oil and gas development and divided the number by the estimated number of wells. The Forest Service then asserts that this represents an overestimate. There is no support for this method of estimation or for the agency's conclusions. For one thing, although the Forest Service asserts that any oil and gas development will not require compression, there is no support for this conclusion. Furthermore, there is no indication that this estimate considered all potential emissions of VOCs and NOx. In fact, the SDEIS does not disclose what emission sources formed the basis of the Forest Service estimates. Part of the problem is that the Forest Service makes no attempt to analyze and assess the expected reasonably foreseeable development. Although the agency asserts that 20 wells will be drilled, it is unclear what this actually refers to. Is it 20 multi-well pads? Is it 20 wells that will be recompleted several times over the life of the wells? Is it 20 wells that will be developed using hydraulic fracturing techniques or cavitation? Is it 20 coalbed methane wells? Traditional natural gas wells? Shale gas wells? The Forest Service does not appear to have sufficiently analyzed the reasonably foreseeable development such that it has a sufficient understanding of the nature of the development and the likely impacts that would result from the development.

- **Nitrogen Dioxide**

The SEIS does not analyze and assess the potentially significant impacts to the current NAAQS for nitrogen dioxide. On February 9, 2010, the EPA finalized revisions to the nitrogen dioxide NAAQS, supplementing the current annual standard of 53 parts per billion with a 1-hour standard of 100 parts per billion. *See* Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Final Rule, 75 Fed. Reg. 6474-6537 (Feb. 9, 2010). These NAAQS were originally proposed on July 15, 2009. *See* Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Proposed Rule, 74 Fed. Reg. 34404-34466 (July 15, 2009). These NAAQS became effective on April 12, 2010. The Forest Service must analyze and assess the impacts of the proposed oil and gas development to the hourly nitrogen dioxide NAAQS.

### **3. The SDEIS Still Fails to Adequately Analyze and Assess a Range of Reasonable Leasing Alternatives**

NEPA requires agencies to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternatives uses of available resources.” 42 U.S.C. § 4332(2)(E). To achieve these ends, an EIS must “[r]igorously explore and objectively evaluate *all* reasonable alternatives.” 40 C.F.R. § 1502.14; *Utahns for Better Transp.*, 305 F.3d at 1166 (emphasis added). This alternatives analysis is “the heart of the [EIS].” 40 C.F.R. § 1502.14. Unfortunately, in the case of the SDEIS and FEIS, the Forest Service appears to have failed to analyze and consider in detail a range of reasonable leasing alternatives in accordance with 40 CFR § 1502.14. Of particular concern is that every action alternative considered by the Forest Service is virtually similar in the amount of oil and gas leasing allowed and in the environmental impacts.

- **Alternatives that address air quality impacts:**

We request the Forest Service consider alternatives to address potentially significant air quality impacts, such as haze, nitrogen dioxide, and ozone air pollution impacts. There are a number of potential alternatives that the Forest Service could require.

To begin with, the Forest Service could establish leasing stipulations that require the use of specific technologies and/or practices. For example, Conoco-Phillips, an oil and gas company active on the Carson National Forest, has optimized its compression system, increased the efficiency of its production operations, and installed plunger lifts in its wells, all of which the company reports have led to reductions in both NOx and VOC emissions. *See* Gantner, B., “COP Efforts to Reduce Greenhouse Gas Emissions,” presentation given for EPA Natural GasSTAR Program (September 13, 2007), *available at* [http://www.epa.gov/gasstar/documents/workshops/durango-2007/02\\_conocophillips\\_experience.pdf](http://www.epa.gov/gasstar/documents/workshops/durango-2007/02_conocophillips_experience.pdf). Conoco-Phillips estimated that increasing the efficiency of production operations, such as through insulating separators and tanks, could reduce NOx emissions by more than 282,000 tons/year. *Id.* at slide 18. Other companies operating in the San Juan Basin, including BP and Weatherford, have also reported significant reductions in VOCs using reduce emission completion practices. *See* BP, “Greenhouse Gas Reduction Project,” presentation given for EPA Natural GasSTAR Program (September 13, 2007), *available at* [http://www.epa.gov/gasstar/documents/workshops/durango-2007/06\\_%20bp\\_rec\\_Greenhouse\\_gas\\_emision\\_reduction.pdf](http://www.epa.gov/gasstar/documents/workshops/durango-2007/06_%20bp_rec_Greenhouse_gas_emision_reduction.pdf); Buckingham, S., “Controlled Pressure Drilling and Testing Services,” presentation given for EPA Natural GasSTAR Program (September 13, 2007), *available at* [http://www.epa.gov/gasstar/documents/workshops/durango-2007/05\\_weatherford\\_rec.pdf](http://www.epa.gov/gasstar/documents/workshops/durango-2007/05_weatherford_rec.pdf). In addition to reducing VOCs, reduced completions can limit methane losses, meaning enhanced product recovery. BP has also made progress in using plunger lifts to reduce the frequency of blowdowns, thereby limiting VOC and methane emissions. *See* Robinson, D., “Plunger lifts and smart automation,” Presentation for EPA Natural GasSTAR Program (April 29, 2008), *available at* <http://www.epa.gov/gasstar/documents/workshops/2008-tech-transfer/denver3.pdf>.

With regards to VOC emissions, a number of cost-effective technologies and practices exist to keep emissions in check. A recent article in the Journal of Petroleum Technology identified over a dozen technologies and practices to help reduce methane emissions from wells,

completions, tanks, separators, facilities, flowlines, pneumatics, and compressor engines. *See* Fernandez, R., R. Petrusak, D. Robinson, and D. Zavadil, “Cost-effective methane emissions reductions for small and midsize natural gas producers,” *Journal of Petroleum Technology* (June 2005), *available at* <http://www.epa.gov/gasstar/documents/workshops/2005-annual-conf/robinson.pdf>. Because methane is emitted with VOCs, reducing methane both retains a valuable product and limits emissions of ozone-forming pollution. Often times, reducing both VOC and methane emissions is simply a matter of enhancing the inspection and maintenance of facilities. *See* Exhibit 16, Robinson, D., “Directed Inspection and Maintenance and Infrared Leak Detection,” presentation for EPA Natural GasSTAR Program (September 11, 2007), *available at* [http://www.epa.gov/gasstar/documents/workshops/glenwood-2007/06\\_dim\\_in\\_gas\\_production\\_facilities.pdf](http://www.epa.gov/gasstar/documents/workshops/glenwood-2007/06_dim_in_gas_production_facilities.pdf).

In 2007, the WRAP released a report detailing a number of methods to reduce both NO<sub>x</sub> and VOC emissions from oil and gas operations. *See* Bar-Ilan, A., R. Friesen, A. Pollack, and A. Hoats, “Draft Final Report, WRAP Area Source Emissions Inventory Projections and Control Strategy Evaluation, Phase II,” Report Prepared for Western Regional Air Partnership (July 2007) at 4-1—4-51, *available at* [http://www.wrapair.org/forums/ogwg/documents/2007-10\\_Phase\\_II\\_O&G\\_Final\)Report\(v10-07%20rev.s\).pdf](http://www.wrapair.org/forums/ogwg/documents/2007-10_Phase_II_O&G_Final)Report(v10-07%20rev.s).pdf). The report detailed opportunities to reduce NO<sub>x</sub> emissions from compressor engines and drill rig engines, such as post-combustion controls, and a number of opportunities to reduce VOC emissions from glycol dehydrators, pneumatic devices, tanks, and completion/flaring/venting activities. These technologies and practices could form a strong foundation for a rigorous alternatives analysis by the Forest Service, and ultimately the development of appropriate lease stipulations.

Clearly a number of alternatives exist to address the air quality impacts of oil and gas development on the Santa Fe National Forest. We request the Forest Service analyze in detail such alternatives to ensure full protection of air quality.

#### **4. It does not appear that the proposed oil and gas development will comply with the Santa Fe National Forest Land and Resource Management Plan**

The Forest Service is required to ensure its actions are consistent with the 1987 Carson National Forest Land and Resource Management Plan (“LRMP”), as amended. *See* 16 USC § 1604(i). Unfortunately, the Forest Service failed to do so with regards to protecting air quality.

In particular, it is not apparent that the Forest Service will ensure compliance with the following standards and guidelines:

- **F04:** Management activities will be planned so that air quality will meet applicable Federal, state, and local regulations; and
- **Watershed & Air F01:** In the Class I Air Quality Areas (Pecos Wilderness except 1980 additions and San Pedro Parks) maintain high quality visual conditions...Impacts of air pollution generating activities will be predicted using current modeling techniques.

We are concerned that the Forest Service has not demonstrated that these standards and

guidelines will be complied with. In particular, it is not apparent that the air pollution impacts of oil and gas development to Class I Air Quality Areas has been predicted using current modeling techniques.

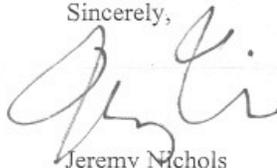
**5. The Forest Service is not in Compliance with the Endangered Species Act**

As WildEarth Guardians has informed the Forest Service in previous notice letters and most recently in a complaint filed in U.S. District Court in Arizona (*see* [http://www.wildearthguardians.org/Portals/0/support\\_docs/MSO\\_reinitiation\\_complaint\\_FINAL\\_6\\_24\\_2010.pdf](http://www.wildearthguardians.org/Portals/0/support_docs/MSO_reinitiation_complaint_FINAL_6_24_2010.pdf)), the Forest Service is not in compliance with the biological opinion governing the implementation of LRMPs in Region 3. The Forest Service has in fact reinitiated consultation with the Fish and Wildlife Service in light of its ongoing failure to comply with terms and conditions in the current biological opinion, as well as the agency's admitted failure to limit incidental take in accordance with the biological opinion. Since apparently reinitiating consultation, the Forest Service has yet to prepare a biological assessment or submit such a biological assessment to the Fish and Wildlife Service.

Furthermore, the SDEIS and FEIS simply do not demonstrate that authorizing ramped up oil and gas leasing on the Santa Fe National Forest would comply with Section 7 of the Endangered Species Act, 16 USC § 1536.

Indeed, the Forest Service claims that implementation of the ROD "would not adversely affect MSO [Mexican spotted owl] populations on the Santa Fe National Forest." FEIS at 119. As a result, the Forest Service has not undertaken consultation with the U.S. Fish and Wildlife Service. The Forest Service's position is based on the assertion that timing stipulations set forth in the ROD would adequately protect the Mexican spotted owl and its habitat, and that further analysis and, if necessary, consultation, would be completed at the drilling stage. However, there is no analysis demonstrating that timing stipulations would protect the Mexican spotted owl and its habitat. Furthermore, as already explained, the issuance of oil and gas leases is an irreversible commitment of resources that requires a detailed analysis of impacts. The Forest Service cannot defer consultation under the ESA at the leasing stage.

Sincerely,



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